UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to NMFS No: 2004/00734

June 15, 2006

William A. Wood
Forest Supervisor
Salmon-Challis National Forest
1206 S. Challis Street
Salmon, Idaho 83467

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Proposed and Ongoing Activities in the Panther Creek Watershed (Non-Diversion); HUCs 1706020315, 1706020316, 1706020317,1706020318,1706020319, 1706020320, 1706020321, 1706020322, and 1706020323; Lemhi County, Idaho

Dear Mr. Wood:

The enclosed document contains a biological opinion (Opinion) prepared by the National Marine Fisheries Service (NMFS) pursuant to Section 7(a)(2) of the Endangered Species Act (ESA) on the effects of ongoing and proposed actions in the Panther Creek Watershed. In this Opinion, NMFS concludes that the proposed actions are not likely to jeopardize the continued existence of Snake River spring/summer Chinook salmon and Snake River Basin steelhead, or result in the destruction or adverse modification of critical habitat designated for Snake River spring/summer Chinook salmon and Snake River Basin steelhead.

As required by section 7 of the ESA, an incidental take statement prepared by NMFS is provided with the Opinion. The incidental take statement describes reasonable and prudent measures (RPMs) NMFS considers necessary or appropriate to minimize incidental take associated with this action. It also sets forth nondiscretionary terms and conditions, including reporting requirements, that the Federal agency and applicant, if any, must comply with to carry out the RPMs. Incidental take from actions by the action agency and applicant that meets these terms and conditions will be exempt from the ESA take prohibition.

This document also includes the results of our analysis of the action's likely effects on essential fish habitat (EFH) pursuant to Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes three conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects on EFH. These Conservation Recommendations are a non-identical subset of the ESA terms and conditions. Section 305(b)(4)(B) of the MSA requires Federal agencies to provide a detailed written response to NMFS within 30 days after receiving these recommendations. If the response is inconsistent with the recommendations, the Salmon-Challis National Forest must explain why the recommendations will not be followed, including the justification for any disagreements over the

effects of the action and the recommendations. In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, in your statutory reply to the EFH portion of this consultation, we ask that you clearly identify the number of conservation recommendations accepted.

If you have questions regarding this consultation, please contact Dan Blake, East Idaho Branch Office, (208) 756-5180.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

Enclosure:

cc: R. Rose – USFS
J. Kraayenbrink – BLM
D. Mignogno – USFWS
T. Curet – IDFG
T. Blau – IDWR
R. Miles – Nez Perce Tribe
N. Murillo – Shoshone-Bannock Tribes

Endangered Species Act – Section 7 Formal Consultation
Biological Opinion

and

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Proposed and Ongoing Activities in the Panther Creek Watershed
HUCs 1706020315, 1706020316, 1706020317, 1706020318, 1706020319, 1706020320, 1706020321, 1706020322, and 1706020323;
Lemhi County, Idaho

Lead Action Agency:	U.S. Forest Service Salmon-Challis National Forest
Consultation Conducted By:	National Marine Fisheries Service, Northwest Region
Date Issued:	June 15, 2006
Issued by:	F.r Michael R Crouse D. Robert Lohn Regional Administrator
NMFS No.:	**2004/00734**

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BA	Biological Assessment
BAER	Burned Area Emergency Rehabilitation
BMPs	Best Management Practices
cfs	cubic feet per second
CRB	Columbia River Basin
DQA	Data Quality Act
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
Forest Plan	Salmon Land and Resource Management Plan
FWS	U.S. Fish and Wildlife Service
HUC	Hydrologic Unit Codes
IDFG	Idaho Department of Fish and Game
LPCS	Lower Panther Creek subwatershed
LRMP	Land and Resource Management Plan
MPCS	Middle Panther Creek subwatershed
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NCS	Napias Creek subwatershed
NMFS	National Marine Fisheries Service
Opinion	Biological Opinion
PCE	Primary Constituent Elements
Review Team	Snake River Basin Critical Habitat Analytical Review Team
RPMs	Reasonable and Prudent Measures
SCNF	Salmon-Challis National Forest
UPCS	Upper Panther Creek subwatershed
VSP	Viable Salmonid Population

1. INTRODUCTION

The biological opinion (Opinion) and incidental take statement portions of this consultation were prepared by the National Marine Fisheries Service (NMFS) in accordance with section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531, *et seq*.), and implementing regulations at 50 CFR 402. Consistent with a decision rendered by the 9th Circuit Court of Appeals on August 6, 2004, in *Gifford Pinchot Task Force et al. v. U.S. Fish and Wildlife Service* (378 F.3d 1059), the regulatory definition of "destruction or adverse modification of critical habitat" at 50 CFR 402.02 was not applied to complete the following analysis with respect to critical habitat; statutory provisions of the ESA were relied on instead. The proposed actions have been found to be consistent with Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH) (USDA and USDI 1995) and Land and Resource Management Plan (LRMP) directions.

The essential fish habitat (EFH) consultation was prepared in accordance with Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 USC 1801 *et seq*.) and implementing regulations at 50 CFR 600. The administrative record for this consultation is on file at the NMFS Idaho State Habitat Office in Boise.

1.1. Background and Consultation History

The Salmon-Challis National Forest (SCNF) proposes to implement ongoing and new activities in the Panther Creek Watershed so it can manage Federal lands for sustainable multiple uses. The specific actions included in this consultation are issuing permits for six grazing allotments; carrying out three culvert removal projects; installing two fords and operating and maintaining a third ford; operating and maintaining two trailheads; operating and maintaining two developed campgrounds; and operating and maintaining a special use permit for an electricity transmission line. The SCNF is proposing the actions according to its authority under the Organic Act of 1897, the Granger-Thye Act of 1950, the Land and Water Conservation Act of 1965, and the Forest Land and Policy Management Act of 1976.

A previous consultation was completed by NMFS for actions in the Panther Creek Watershed affecting Snake River spring/summer Chinook salmon and their designated critical habitat (Stelle 1995). A new consultation was pursued following the listing of Snake River Basin steelhead. NMFS received a draft biological assessment (BA) on June 8, 2000, with updates for the Panther Creek Watershed, and the SCNF produced a revised draft BA on December 27, 2002. Coordination meetings involving NMFS and the SCNF were held on February 3 and February 5, 2003, to discuss the revised draft BA and comments compiled by the interagency Salmon-Challis Level 1 Team. On February 14, 2003, NMFS sent a letter to the SCNF requesting additional information.

A revised BA was received by NMFS from the SCNF on June 28, 2004, with a letter requesting initiation of formal consultation. On July 29, 2004, NMFS responded to the SCNF with a letter stating that information provided to date was sufficient to initiate but not complete formal consultation; the letter also set up provisions for extending the typical consultation timeframe and using an interagency team to amend the BA. Following this, the SCNF and NMFS began to discuss the outstanding information needs, and the SCNF, NMFS and the U.S. Fish and Wildlife Service (FWS) decided to consult separately on the water diversions that were included in the June 2004 BA. On October 25, 2004, NMFS sent a letter to the SCNF requesting an extension to the typical 135-day formal consultation timeframe, which would have ended November 10, 2004. NMFS also met with the SCNF and the FWS on October 25, 2004, to discuss extending the consultation timeframe, gathering additional information, and conducting additional analysis. Agreement was reached for the SCNF to finalize the BA by February 15, 2005, for the consultation period to be extended to February 28, 2005, and for NMFS to provide a final Opinion by April 15, 2005. NMFS sent a letter to the SCNF on November 2, 2004, documenting the agreement reached on deadline extensions. On February 1, 2005, NMFS, the SCNF, and the FWS discussed revisions to the BA and agreed to extend the consultation timeframe by an additional month (final BA by March 15, 2005, and draft Opinion by May 15, 2005). The SCNF confirmed this decision with a letter to NMFS dated February 16, 2005.

In the final BA, issued on March 15, 2005, the SCNF concludes that the Forney Allotment is "likely to adversely affect" Snake River spring/summer Chinook salmon and Snake River Basin steelhead, is "not likely to adversely affect" designated critical habitat for Chinook salmon and "is likely to adversely affect" proposed critical habitat for steelhead. The SCNF concludes that all other actions included in the BA are "not likely to adversely affect" Snake River spring/summer Chinook salmon, Snake River Basin steelhead, and their designated or proposed critical habitat. A draft Opinion was provided to the SCNF on May 26, 2005. This draft Opinion was discussed at a July 12, 2005, meeting, and appropriate changes were made. A revised draft was provided to the SCNF on July 18, 2005, and a meeting with permittees was held on August 30, 2005. Additional revisions were made, with another draft provided to the SCNF and permittees on August 31, 2005. A field review was conducted with personnel from the SCNF and NMFS on September 15, 2005. The SCNF provided an amendment to the BA based on information gathered during the field review and some changes to proposed actions on February 14, 2006. The letter accompanying the amendment extended the consultation through April 15, 2006. NMFS provided a revised draft Opinion on February 27, 2006. The SCNF provided comments in early March and additional clarification in a March 10, 2006, letter that were incorporated into the Opinion.

NMFS contacted the Nez Perce Tribe and Shoshone-Bannock Tribes pursuant to the Secretarial Order (June 5, 1997) because the proposed activities in the Panther Creek Watershed are likely to affect tribal trust resources. On October 13, 2004, Jim Huinker, NMFS, provided information on the proposed actions to the Nez Perce Tribe and the Shoshone-Bannock Tribes. The Nez Perce Tribe replied on October 18, 2004, requesting involvement during consultation. The Shoshone-Bannock Tribes provided fish survey data to NMFS on November 10, 2004, and the

information was incorporated into the Opinion. A draft Opinion was provided to both tribes on May 26, 2005, with a request for comments by June 10, 2005. The tribes did not respond to the request.

1.2. Proposed Actions

The SCNF manages all the Federal lands in the Panther Creek Watershed, which comprise more than 340,000 acres, or 98.5 percent of the total land (Forster and Rieffenberger 1993). In managing lands in the watershed, the SCNF implements a variety of actions. For purposes of this consultation, the proposed actions are issuing permits for six grazing allotments; carrying out three culvert removal projects; installing two fords and operating and maintaining a third ford; operating and maintaining two trailheads; operating and maintaining two developed campgrounds; and operating and maintaining a special use permit for an electric transmission line. These actions are described below by activity type and are summarized in Table 1 with a general description of where actions occur in a subwatershed, using the hydrologic unit codes (HUC) provided by the SCNF. Fifth field HUCs include the Upper Panther Creek subwatershed (UPCS), Middle Panther Creek subwatershed (MPCS), Napias Creek subwatershed (NCS), and Lower Panther Creek subwatershed (LPCS). Descriptions are based on information provided in the BA.

Table 1. Location of Proposed Actions within Sixth Field HUCs

5th field HUCs	6th field HUCs	Allotments	Culverts	Fords	Trailheads	Campgrounds	Special Use Permit
UPCS	Panther-Headwaters	x	---	---	---	---	---
	Panther-Cabin	x	x	---	---	---	---
	Panther-Porphyry	x	---	---	---	---	---
	Musgrove Creek	x	---	---	---	---	---
	Moyer Creek	x	---	---	---	---	---
MPCS	Panther-Copper	x	---	---	---	x	---
	Woodtick Creek	x	x	x	---	---	---
	Blackbird Creek	---	---	---	---	---	x
	Panther-Fawn	x	---	---	---	x	x
	Deep Creek	x	---	---	---	---	---
	Panther-Little Deer	x	---	---	---	---	x
	Big Deer Creek	---	---	---	---	---	---
NCS	Upper Napias Creek	x	---	---	---	---	x
	Arnett Creek	x	---	---	---	---	---
	Napias-Phelan	x	---	---	---	---	x
	Lower Napias Creek	x	x	---	---	---	x
LPCS	Panther-Trail	x	---	x	x	---	---
	Beaver Creek	x	---	---	---	---	---
	Panther-Garden	---	---	x	x	---	---
	Clear Creek	---	---	---	x	---	---

1.2.1. Grazing Allotments

The SCNF proposes to issue permits that will allow for the continued use of six grazing allotments in the Panther Creek Watershed. As part of the action, fencing will be placed around portions of the Forney Allotment. Within the watershed, the Forney, Deer-Iron, Morgan Creek, Williams Basin-Napias Creek, Diamond Moose, and Coiner allotments collectively encompass 166,589 acres, which is nearly 50 percent of the total watershed area. Although each permit covers the entire area within the boundaries of an allotment, 20,908 acres or about 6 percent of the total watershed, is considered suitable for grazing. Suitability was determined from range allotment analysis completed by range conservationists based on percent slope, distance to water, amount of forage, vegetation and soil conditions, and accessibility. Cattle may use some of the unsuitable acreage, but the suitable acreage is used to determine the number of cattle permitted on the allotment and constitutes the areas where cattle are realistically expected to graze. Cattle graze across vast landscapes, and their movement is controlled as they are herded toward desired locations. However, uncertainty exists in regard to the exact location where cattle will graze and cattle movement cannot be completely controlled. Monitoring of stubble height standards, which involves measuring plant heights, provides monitoring and management tools to control the amount of grazing that occurs in a given area. The SCNF is beginning to use its adaptive management strategy for grazing within riparian ecosystems (Gamett *et al.* 2005). This requires site specific measurements of habitat indicators, including bank alteration and woody browse, every 3 years. Sites not meeting the SCNF's criteria are measured annually. These indicators may substitute for stubble height standards, when appropriate. The grazing allotments are discussed individually below.

Forney Allotment

The Forney Allotment is entirely within the Panther Creek Watershed and includes 31,978 acres, with 9,865 acres the SCNF considers suitable for grazing. The allotment includes all or portions of the Panther-Cabin, Panther-Porphyry, Musgrove, and Moyer Creek subwatersheds. The proposed action for the Forney Allotment is to allow grazing by 266 cow/calf pairs from June 1 through October 31, under a three pasture deferred-rotation grazing system. The Westside Unit, which covers major portions of the Panther-Cabin and Panther-Porphyry subwatersheds and the right bank of Musgrove Creek, is grazed annually from June 1 to July 1. The Eastside Unit, which covers the lower half of the Moyer Creek subwatershed, is grazed annually from July 1 to October 31. The Holding Pasture, which is in the Panther-Cabin subwatershed, is used for a week in the middle or end of each October to congregate cattle at the end of the grazing season. The action also includes placing new fencing to protect sensitive areas on the east side of Panther Creek between Sawmill Gulch and McGowan Gulch, on the lower reach of Fourth of July Creek, and at a watering site on McGowan Gulch.

On the Westside Unit, a group of 30 cow/calf pairs are allowed to graze in a riparian pasture for a maximum of 2 weeks each year. On this unit, grazing pressure has been and is proposed to be concentrated most intensely along short reaches in the Panther-Porphyry subwatershed around

lower Fourth of July Creek and lower Porphyry Creek in order to decrease the pressure along Panther Creek. The SCNF will construct 1.2 miles of four-strand barbed wire, and buck and pole fencing in July or August 2006 to protect the lowest ½ mile of Fourth of July Creek.

On the Eastside Unit, approximately 30 cow/calf pairs are allowed to graze adjacent to Moyer Creek annually for a maximum of 6 weeks prior to September 15. The SCNF is reducing the intensity of grazing along Moyer Creek. On the Eastside Unit, several stock watering ponds and troughs are scattered between intermittent gulches to keep the cattle in upland areas. The SCNF has a memorandum of agreement with the Noranda Mining Company that includes a schedule to complete, by spring 2006, livestock exclusion fencing along the company's property, which is on the east side of Panther Creek between Sawmill Gulch and McGowan Gulch. The SCNF also proposes to construct, by fall 2007, a water gap and fence at an upper portion of McGowan Gulch that is immediately downstream of a private land fence.

To evaluate livestock grazing trends, the SCNF established five long-term riparian evaluation sites and key areas, with two on the Westside Unit, two on the Eastside Unit, and one on the Holding Pasture. Stubble height standards are 4 inches in upland areas and along the key areas on the Westside of Panther Creek and Moyer Basin. Stubble height standards are 6 inches for the riparian pasture, Moyer Creek, and the Holding Pasture. Six riparian photo points have also been established on the allotment to collect visual evidence of long-term changes in condition of the allotment. Exclosure fences, including the Holding Pasture, protect salmonid spawning areas from cattle grazing and watering, except along Panther Creek upstream of the Fourth of July Creek confluence. To ensure proper use of the allotment, permittees will monitor Holding Pasture gates at least once each week during the grazing season to ensure cattle remain in the Eastside or Westside units.

Deer-Iron Allotment (Portions of South Fork Unit in the Panther Creek Watershed)

The Deer-Iron Allotment encompasses 49,326 acres, with 7,473 acres in the Panther Creek Watershed; the SCNF considers 1,492 acres in the Panther Creek Watershed to be suitable for grazing. The proposed action for the Deer-Iron Allotment is to allow grazing by 321 cow/calf pairs from June 16 to June 30, and 421 cow/calf pairs from July 1 to October 7 on portions of the South Fork Unit in the Panther Creek Watershed.

Grazing occurs under a three-pasture, rest-rotation system. The Peel Tree and Degan Mountain units are entirely outside the Panther Creek Watershed. About one-third of the South Fork Unit is in the Panther Creek Watershed, in the upper portions of the Moyer Creek and Woodtick Creek subwatersheds. Based on the rest-rotation system, grazing occurs on the South Fork Unit primarily in September the first year of the rotation and primarily in August the second year; no grazing occurs the third year. In the South Fork Unit, approximately 70 to 100 cow/calf pairs graze in the Panther Creek Watershed from 2 weeks to 1 month (Garechana, pers. com. 2005). Grazing does not occur along perennial fish-bearing streams, but does occur in two wet meadows in the Moyer Peak area.

The long-term riparian evaluation sites and key areas for the South Fork Unit are outside of the Panther Creek Watershed but are considered to be representative of the entire South Fork Unit. Long-term trend information is also derived from the Iron Creek monitoring sites. Stubble height standards are 4 inches for all key areas. Riparian evaluation monitoring has indicated that the South Fork Unit has met utilization standards and exhibits improved range conditions.

Morgan Creek Allotment (Portions of Units 1 and 2B in the Panther Creek Watershed)

The Morgan Creek Allotment covers 89,219 acres, with 19,374 acres in the Panther Creek Watershed; the SCNF considers 2,710 acres in the Panther Creek Watershed to be suitable for grazing. The proposed action for the Morgan Creek Allotment is to allow grazing by 1,225 cow/calf pairs from May 1 to November 15 each year on portions of Units 1 and 2B in the Panther Creek Watershed. This action involves six permittees. Part of the Morgan Creek Allotment that is outside the Panther Creek Watershed is on land managed by the Bureau of Land Management (BLM). There are four grazing units in the Morgan Creek Allotment: Unit 1, Unit 2A, Unit 2B (Prairie Basin Unit), and Unit 3. Units 2A and 3 are entirely outside the Panther Creek Watershed. The Prairie Basin Unit and Unit 1 include portions of the Panther Creek Watershed. The Prairie Basin Unit encompasses most of the Panther Headwaters subwatershed and a small portion of the Moyer Creek subwatershed. A very small portion of Unit 1 falls within the Panther Headwaters subwatershed.

Grazing occurs under a three-pasture, rest-rotation system. Based on the rotation system, grazing occurs on Unit 1 in June and early July the first year and in late July and August the second year; no grazing occurs the third year. Grazing occurs on the Prairie Basin Unit in August and early September the first year and in mid July and August the third year; no grazing occurs the second year. Riders accompany the cattle to keep them moving slowly through the units instead of remaining in a small area for an extended time. This approach is designed to allow plants to produce seeds at least 2 of every 3 years. In addition to cattle, 51 horses are allowed to graze the allotment between May 1 and December 31. The horses are permitted to graze the same units as the cattle under the same rotation schedule, but rarely use the Prairie Basin Unit.

The Morgan Creek Summit Holding Facility and the Weasel Creek Gathering Facility are used to improve control of livestock movement on and off the unit and facilitate grazing distribution. The former will hold up to 300 cattle overnight as they are being pushed on and off the unit. The latter spreads cattle movement across multiple days to help eliminate problems with cattle entering Panther Creek.

Cattle have been totally excluded from two reaches of upper Panther Creek, near Morgan Creek Summit, and between Weasel Creek, and the Association Pasture. The Association Pasture is used for horses and sick cattle. Three reaches of Panther Creek in the lower section of the Panther Headwaters subwatershed, between Opal Creek and Cabin Creek, have no riparian protections; riders remove cattle when needed. Nine key areas are in place to monitor stubble height utilization throughout the Prairie Basin Unit, along Johnly Gulch, Opal Creek, Blue Creek, Calf Drop Ridge, South Fork Moyer Creek, Bull Springs, the hillside above Bull Springs,

Panther Creek, and Silver Creek. One key area is located in the Panther Creek headwaters of Unit 1. Stubble height standards are 4 inches for all key areas except Opal Creek and South Fork Moyer Creek, which have a 6-inch standard.

Williams Basin-Napias Creek Allotment (Deep Creek and Phelan Creek Units)

The Williams Basin-Napias Creek Allotment encompasses 123,940 acres, with 105,460 acres in the Panther Creek Watershed; the SCNF considers 5,704 acres in the Panther Creek Watershed to be suitable for grazing. The proposed action for the Williams Basin-Napias Creek Allotment is to allow grazing by 668 cow/calf pairs from June 11 until October 30 each year on the Deep Creek and Phelan Creek Units. There are four grazing units in the Williams Basin-Napias Creek Allotment: Deep Creek Unit, Phelan Creek Unit, Spring Creek Unit, and Williams Basin Unit. The Deep Creek and Phelan Creek units are entirely within the Panther Creek Watershed whereas the Spring Creek and Williams Basin units are entirely outside the Panther Creek Watershed. The Deep Creek Unit includes the entire Deep Creek subwatershed and major portions of the Panther-Fawn, Panther-Copper, Woodtick Creek, and Lower Napias Creek subwatersheds. The Phelan Creek Unit includes large portions of the Upper Napias Creek, Arnett Creek, Napias-Phelan, Lower Napias Creek, Panther-Little Deer, Panther-Fawn, and Panther-Trail subwatersheds. A very small portion of the Beaver Creek subwatershed's headwaters falls within the Phelan Creek Unit.

Grazing occurs under a four-pasture, rest-rotation system, with the Deep Creek and Phelan Creek units used in alternating years. Cattle are moved onto either of these units between July 5 and July 10. Approximately one-fourth of the cattle are removed every 8 days during a four-stage staggered removal between September 26 and October 30. When Little Deep Creek is grazed, livestock must be removed on or before September 9 to protect spawning bull trout. Riders check the area and remove cattle at least weekly in this area. The first year of the grazing rotation is on the Deep Creek Unit, and the cattle are moved to the Woodtick Creek subwatershed initially along the Wood-Swan Road. The Wood-Swan Road is at a higher elevation than a former route and has allowed the permittees to meet stubble height standards. The second year of the grazing rotation is on the Phelan Creek Unit. Cattle begin grazing in the Whitehorse Basin/Big Jureano Creek area in the Panther-Little Deer subwatershed and move into the Napias Creek areas as the summer progresses.

The terrain reduces the opportunity for cattle to enter many of the larger streams. Spawning reaches along Deep Creek are in canyon reaches, with few opportunities for grazing. Cattle infrequently access Panther Creek coming down the Deep Creek Road or the Copper Creek Road, but are removed by the permittee immediately upon detection. Similar problems occur infrequently along Panther Creek and lower Napias Creek when cattle graze the Phelan Unit. Five drift fences are in place on the Deep Creek and Phelan Creek units to improve cattle distribution and control unwanted drift. The stubble height utilization standard along Little Deep Creek is 6 inches to facilitate stream and riparian recovery. To reduce cattle impacts to riparian

areas along Phelan Creek, the riparian utilization standard is 5 inches. Stubble height standards are 4 inches in all other Panther Creek Watershed portions of the Williams Basin-Napias Creek Allotment.

Several monitoring measures are in place for the Deep Creek Unit. Along Little Deep Creek, a long-term riparian evaluation site has been in place since 2000. Key areas are monitored along Little Deep Creek, Little Woodtick Creek, Spring Creek, and Fawn Creek. Four riparian photo points are established along Little Deep Creek, Spring Creek and two unnamed tributaries. A sediment-core monitoring site was established in 2001 that is monitored every other year.

Monitoring measures are also in place for the Phelan Creek Unit. A long-term riparian evaluation site is in place along Moccasin Creek. Additional riparian evaluation sites were established and Phelan, Arnett, and Napias creeks in 2004. Key areas are monitored along Cutler Creek, Moccasin Creek, Ringbone Creek, Napias Creek, Arnett Creek, and Pony Lake. Another key area is being established along Phelan Creek. Two riparian photo points are along lower Pony Creek and Moccasin Creek.

Coiner Allotment

The Coiner Allotment consists of 220 acres that are surrounded on three sides by the 1,006 acre Coiner Ranch. The 220 acres are primarily within a riparian area along Phelan Creek and the South Fork of Phelan Creek in the Napias-Phelan subwatershed. This area is fenced in by private land. The proposed action for the Coiner Allotment is to allow grazing by two cow/calf pairs from June 20 to October 15 each year.

No conservation measures are currently employed on the Coiner Allotment and the cattle are able to enter the creeks. No monitoring sites are established, but the SCNF proposes a key area within the allotment. The stubble height standard is 4 inches for the allotment.

Diamond-Moose Creek Allotment (Portions of Moose Creek Unit in Panther Creek Watershed)

The Diamond-Moose Creek Allotment covers 74,144 acres, with 6,343 acres in the Panther Creek Watershed; the SCNF considers 1,085 acres in the Panther Creek Watershed to be suitable for grazing. The proposed action for the Diamond-Moose Creek Allotment is to allow grazing by 709 cow/calf pairs from June 1 until October 20 each year on portions of the Moose Creek Unit in the Panther Creek Watershed. A four-stage staggered removal is used that is similar to the Williams Basin-Napias Creek Allotment. There are six grazing units in the Diamond-Moose Creek Allotment: Bird-Comet, Dump Creek-Wicham Unit, Canoe Basin Unit, Deriar Creek Unit, Leesburg Stage Road Unit, and Moose Creek Unit. Approximately 15 percent of the Moose Creek Unit is in the Panther Creek Watershed, and all other units are entirely outside the Panther Creek Watershed. The Moose Creek Unit falls within a major portion of the Upper Napias Creek subwatershed.

Grazing occurs under a one herd, six-pasture, deferred-rotation grazing system. The herd is initially split onto the five eastern units of the allotment. Around August 1, the herd is recombined on the Moose Creek Unit. Cattle move from the western side of the unit to the eastern side of the unit as the summer progresses. The permittees remove cattle from the Upper Napias Creek subwatershed by September 5 to protect bull trout spawning.

To improve cattle distribution and restore riparian habitat in the Napias Creek portion of the allotment, three structures are in place: (1) the Beartrack fence, (2) the Camp Creek drift fence, and (3) a 10-acre riparian exclosure along Upper Napias Creek near the mouth of Sawpit Creek. Four riparian evaluation sites are established across the allotment, with one in the Panther Creek Watershed along Sawpit Creek. There are also 15 key areas for measuring stubble heights, with just one in the Panther Creek Watershed at the Upper Napias Creek riparian exclosure. Stubble height standards are 4 inches for the allotment. One riparian photo point is also in place along Upper Napias Creek near the mouth of Sawpit Creek.

1.2.2. Culvert Removal Projects

The SCNF proposes to remove three culverts at Fourth of July Creek in the lower portions of the Panther-Cabin subwatershed, Woodtick Creek in the middle section of the Woodtick Creek subwatershed, and Mackinaw Creek in the upper portions of the Lower Napias Creek subwatershed. The projects and general conservation measures are described below.

Fourth of July Creek Project

The SCNF proposes to remove a culvert at the Forest Road #227 crossing of Fourth of July Creek. The culvert will not be replaced, and the road will be closed in front of the Fourth of July Creek crossing. The road is currently closed 200 yards beyond the culvert. Prior to culvert removal, the SCNF will move the existing closure gate to its new location. An excavator will be used to create a temporary bypass channel to divert Fourth of July Creek during instream work. The channel will be lined with plastic and will provide fish passage. If fish remain in pools, the SCNF may salvage fish. The culvert will be removed by heavy equipment.

Following culvert removal, the stream channel will be reconstructed to simulate the stream gradient and width in this section of Fourth of July Creek. Side slopes will be graded at a two-to-one slope or flatter. Fill material will be removed to an upland site to avoid sediment delivery to the stream. All disturbed areas will be reseeded with an erosion-control seed mixture, and straw mulch will be applied following reseeding to reduce short-term sediment effects.

Woodtick Creek Project

The SCNF proposes to remove the Woodtick Creek culvert, which is identified as an upstream fish migration barrier. The culvert is on Forest Road #107 behind a year-round closure gate. A ford will be installed at the stream crossing to provide for infrequent access for fire suppression

and weed spraying (see Section 1.2.3). An excavator will be used to create a temporary bypass channel to divert Woodtick Creek during instream work. The channel will be lined with plastic and will provide fish passage. If fish remain in pools, a fish salvage operation may occur. The culvert will be removed by heavy equipment.

Following culvert removal, the stream channel will be reconstructed to simulate the stream gradient and width in this section of Woodtick Creek. Side slopes will be graded at a two-to-one slope or flatter. Fill material will be removed to an upland site to avoid sediment delivery to the stream. All disturbed areas will be reseeded with an erosion-control seed mixture, and straw mulch will be applied following reseeding to reduce short-term sediment effects.

Mackinaw Creek Project

The SCNF proposes to remove the Mackinaw Creek culvert, which is located behind a year-round closure gate near the end of Forest Road #340-C. An excavator will be used to create a temporary bypass channel to divert Mackinaw Creek during instream work. The channel will be lined with plastic and will provide fish passage. Need for a fish salvage operation is not anticipated. The culvert will be removed by heavy equipment.

Following culvert removal, the stream channel will be reconstructed to simulate the stream gradient and width in this section of Mackinaw Creek. Side slopes will be graded at a two-to-one slope or flatter. Fill material will be removed to an upland site to avoid sediment delivery to the stream. All disturbed areas will be reseeded with an erosion-control seed mixture, and straw mulch will be applied following reseeding to reduce short-term sediment effects.

General Conservation Measures

In addition to measures described above, the following conservation measures will be used for each of the culvert removal projects. The projects will occur between July 15 and August 15, prior to ESA-listed salmonid spawning, or after a stream survey confirms the work area is free of adult salmonids and redds. Work will cease and NMFS will be notified if an adult salmonid or redd is found in the action area. Work will not resume until NMFS and the SCNF determine how the potential for take can be minimized. Instream activities at each site will last 1 to 3 days. The SCNF will conduct periodic field observations to monitor the integrity of the stream reach during and following project completion to determine if additional maintenance or improvements are needed. Heavy equipment will be checked for leaks, and any leaks will be repaired prior to entering the stream. Equipment staging, refueling, and storage will occur at least 150 feet from the stream bank. Spill containment kits will be available at the construction sites.

1.2.3. Fords

The SCNF proposes to install fords at the current Woodtick Creek culvert site and at the Birch Creek Trailhead. The existing ford at the Clear Creek Trailhead will continue to be used.

The Woodtick Creek ford installation will be done as part of the culvert removal project. Following culvert removal, a drop structure will be installed near the lower end of the ford to prevent upstream erosion from a deep pool that was generated by the culvert plunge. A new ford across Panther Creek will be installed using heavy machinery to provide access to the Birch Creek Trailhead, which is in the upper portions of the Panther-Trail subwatershed. Conservation measures described in Section 1.2.2 will be applied during installation of the ford, and if fish remain in pools, a fish salvage operation may occur. Sediment control measures will be employed to minimize sediment delivery during installation of the ford.

A ford at the Clear Creek Trailhead crosses Panther Creek through a predominately gravel glide/riffle. This action occurs within the Panther-Garden subwatershed adjacent to the Clear Creek subwatershed. Wave action occurs during vehicle crossings. Once salmonids are observed spawning in this reach, signs will be posted, as necessary, to restrict fording in the affected reach during the spawning season and the egg incubation period.

1.2.4. Trailheads

The SCNF proposes to operate and maintain two trailhead facilities. The trailheads and the associated trails are primarily used during the hunting season, from October through mid-November. They are used to a lesser extent in the summer months.

The Clear Creek Trailhead is at the mouth of Clear Creek within the lowest section of the Clear Creek subwatershed and an upper section of the Panther-Garden subwatershed. The proposed action for the Clear Creek Trailhead is to operate and maintain the trailhead facilities, which include two horse corrals, a sign kiosk, a concrete-vaulted toilet (approximately 200 feet from Panther Creek), several dispersed camping sites, several picnic tables, and campfire rings. There are also isolated areas of intense recreational use along Clear Creek.

The Birch Creek Trailhead is in the upper portions of the Panther-Trail subwatershed in the vicinity of Panther Creek and Birch Creek. The proposed action is to relocate the Birch Creek Trailhead downstream approximately a third of a mile. Currently, the trail crosses a short segment of private property near the trailhead. About one-quarter mile of new trail will be built to connect the new trailhead to the existing trail. The new section of trail will be located outside the RHCA, except for a small portion adjacent to a proposed Panther Creek ford. The parking area and trailhead will be located at an existing dispersed camping site adjacent to Panther Creek. Sediment control measures will be employed to minimize sediment delivery during construction of the new trail.

1.2.5. Campgrounds

The SCNF proposes to operate and maintain two developed campgrounds. Campgrounds are primarily used during the hunting season, from October through mid-November. They are used to a lesser extent in the summer months.

The Deep Creek Campground is in the lower portions of the Panther-Fawn subwatershed along Panther Creek and opposite the mouth of Deep Creek. The proposed action for the Deep Creek Campground is to operate and maintain this recreational site and replace a toilet. The toilet is 80 feet from Panther Creek and will be replaced with a concrete-vaulted toilet when funding becomes available, probably within the next 5 years. There are three developed campsites with space for two dispersed groups. Potable water for the campground is derived from a developed spring onsite.

The McDonald Flat Campground is in the upper portions of the Panther-Copper subwatershed along Panther Creek between Woodtick Creek and Moyer Creek. The proposed action for the McDonald Flat Campground is to operate and maintain the campsite and replace a toilet. The SCNF will remove a fiberglass-vaulted toilet that is 165 feet from Panther Creek and install a concrete-vaulted toilet 175 feet from Panther Creek. The campground has six established campsites, and there are small isolated areas of high recreational use along Panther Creek.

1.2.6. Special Use Permit

The SCNF proposes to issue a special use permit allowing Idaho Power Company to operate and maintain the 30-mile Salmon to Blackbird Transmission Line. The transmission line runs through the Upper Napias Creek, Napias-Phelan, Lower Napias Creek, Panther-Fawn, Panther-Little Deer, and Blackbird Creek subwatersheds. As part of the permit, Idaho Power is allowed access to the transmission lines for maintenance or replacement of poles and lines. Most sections of the lines have access from the existing roads. However, the Missouri Gulch Road near the headwaters of Missouri Gulch and Mackinaw Creek in the Lower Napias Creek subwatershed was obliterated as part of a watershed restoration project due to its proximity to the streams. Most sections of the transmission line can be accessed from existing timber roads. However, a short (*i.e.*, ½ mile) section of the obliterated road may need to reopen for emergency maintenance. If this scenario occurs, sediment control measures will be employed to minimize sediment delivery, and the section of road will be obliterated once repairs are completed.

1.2.7. Conservation Measures

Conservation measures described above as parts of the proposed action are intended to reduce adverse effects on ESA-listed species and their habitats. NMFS regards those conservation measures as integral components of the proposed action, expects that all proposed project activities will be completed consistent with those measures, and has completed the effects

analysis accordingly. Any project activity that deviates from these conservation measures will be beyond the scope of this consultation, will not be exempted from the prohibition against take as described in the attached incidental take statement, and will require further consultation to determine what effect the modified action may have on ESA-listed species or critical habitats.

1.3. Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For purposes of this consultation, the action area is comprised by four fifth field HUCs in the Panther Creek Watershed as delineated by the SCNF, including the UPCS (67,514 acres or 105.5 square miles), the MPCS (139,495 acres or 217.9 square miles), the NCS (54,929 acres or 85.8 square miles), and the LPCS (84,247 acres or 131.6 square miles). These fifth field HUCs are comprised by several smaller subwatersheds that were described in the BA, and as shown in Table 1. Panther Creek is a tributary to the Salmon River and enters the Salmon River at river mile 210, approximately 7 miles downstream of Shoup, Idaho. There are approximately 400 miles of major perennial streams in the Panther Creek Watershed, which are defined by the SCNF as those streams of at least third order with a minimum mean annual flow of 3.0 cubic feet per second (cfs).

Many parts of the action area, including mainstem Panther Creek and several tributaries, are used by Snake River spring/summer Chinook salmon and steelhead for migration and limited amounts of spawning and rearing, which may increase in the future. The area is designated critical habitat for Snake River spring/summer Chinook salmon and Snake River Basin steelhead. The area also includes EFH for Chinook salmon (PFMC 1999), and is in an area where environmental effects of the proposed project may adversely affect EFH for this species. Snake River sockeye salmon are not found within the Panther Creek Watershed, but use the Salmon River as a migratory corridor, including at the mouth of Panther Creek.

2. ENDANGERED SPECIES ACT – BIOLOGICAL OPINION

The ESA establishes a national program to conserve threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the FWS and NMFS, as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats.

This Opinion presents NMFS' review of the status of each species considered in this consultation, the condition of designated critical habitat, the environmental baseline for the action area, all the effects of the action as proposed, and cumulative effects (50 CFR 402.14(g)).

For the jeopardy analysis, NMFS analyzes those combined factors to conclude whether the proposed action is likely to appreciably reduce the likelihood of both the survival and recovery of the affected ESA-listed species.

The critical habitat analysis determines whether the proposed action will destroy or adversely modify designated critical habitat for ESA-listed species by examining any change in the conservation value of the essential features of critical habitat. This Opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.

If the action under consultation is likely to jeopardize the continued existence of an ESA-listed species, or destroy or adversely modify critical habitat, NMFS must identify any reasonable and prudent alternatives for the action that avoid jeopardy or destruction or adverse modification of critical habitat and meet other regulatory requirements (50 CFR 402.02).

2.1. Status of the Species and Critical Habitat

This section defines range-wide biological requirements of each species, and reviews the status of each species and each affected critical habitat relative to those requirements. The present risk of extinction faced by each species informs NMFS' determination of whether additional risk will "appreciably reduce" the likelihood that a species will survive or recover in the wild. The greater the present risk, the more likely any additional risk resulting from the proposed action's effects on the population size, productivity (growth rate), distribution, or genetic diversity of the species will be an appreciable reduction (McElhany *et al.* 2000).

2.1.1. Status of the Species

NMFS reviews the range-wide status of the species affected by the proposed action using criteria that describe a "viable salmonid population" (VSP) (McElhany *et al.* 2000). Attributes associated with a VSP include the abundance, productivity, spatial structure, and genetic diversity; enhance its capacity to adapt to various environmental conditions; and allow it to become self-sustaining in the natural environment. These attributes are influenced by survival, behavior, and experiences throughout the entire life cycle, characteristics that are influenced in turn by habitat and other environmental conditions.

To be considered viable, with a negligible risk of extinction due to threats from demographic variation, local environmental variation, and genetic diversity changes over the long-term, a species should have the following characteristics. It should contain multiple populations so that a single catastrophic event is less likely to cause the species to become extinct, and so that the species may function as a "metapopulation" as necessary to sustain population-level

extinction-recolonization processes. Multiple populations within a species also increase the likelihood that a diversity of phenotypic and genotypic characteristics will be maintained, thus allowing natural evolutionary processes to operate and increase the species' long-term viability. Some of the species' populations should be relatively large and productive to further reduce the risk of extinction in response to a single catastrophic event that affects all populations. If a species consists of only one population, that population must be as large and productive ("resilient") as possible. Some populations in each species should be geographically widespread to reduce the risk that spatially-correlated environmental catastrophes will drive the species to extinction. Other populations in the same species should be geographically close to each other to increase connectivity between existing populations and encourage metapopulation function. Populations with diverse life histories and phenotypes should be maintained in each species to further reduce the risk from environmental catastrophes or changes in environmental conditions that occur too rapidly for an evolutionary response. This genetic diversity allows natural evolutionary processes to operate within a species. Finally, evaluations of species status should take into account uncertainty about species-level processes. Scientific understanding of species-level spatial and temporal processes is limited such that the historical number and distribution of populations serve as a useful goal in maintaining viability of species that likely were historically self-sustaining.

Snake River Spring/Summer Chinook Salmon

The Snake River spring/summer Chinook salmon evolutionarily significant unit (ESU), listed as threatened on April 22, 1992 (57 FR 14653), with and modifications on June 28, 2005 (70 FR 37160), includes all natural-origin populations in the Snake, Tucannon, Grande Ronde, Imnaha, and Salmon Rivers. The fish returning to 15 hatchery programs are also listed, including the Tucannon River conventional Hatchery, Tucannon River Captive Broodstock Program, Lostine River, Catherine Creek, Lookingglass Hatchery, Upper Grande Ronde, Imnaha River, Big Sheep Creek, McCall Hatchery, Johnson Creek Artificial Propagation Enhancement, Lemhi River Captive Rearing Experiment, Pahsimeroi Hatchery, East Fork Captive Rearing Experiment, West Fork Yankee Fork Captive Rearing Experiment, and Sawtooth Hatchery.

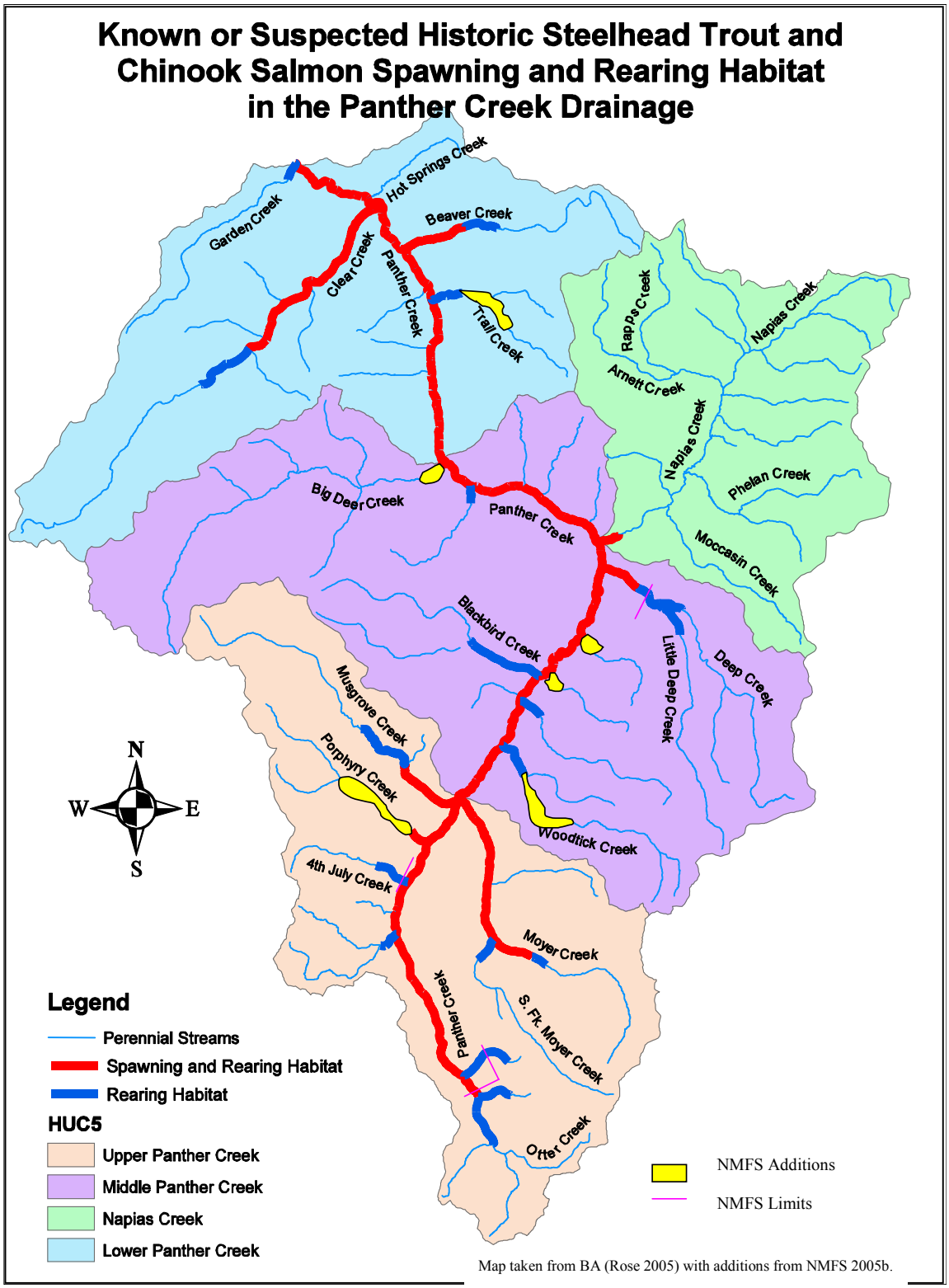
The Snake River Basin is thought to have produced more than 1.5 million adult spring/summer Chinook salmon in some years during the late 1800s (Matthews and Waples 1991). Adult returns counted at Lower Granite Dam reached all-time lows at 1,797 in 1995, but numbers have been higher in some years since 2000 than during the 24 previous years of record (Fish Passage Center 2004). Although there were record returns in 2001 and relatively high returns from 2002 to 2004, numbers in general have been very low for the last several decades in comparison to historic levels. The numbers are also low in comparison to interim target species recovery levels for the Snake River Basin. Interim NMFS annual targets include spawning aggregations averaged over 8 years of 48,150 Snake River spring/summer Chinook salmon. Annual spawning targets are 700 Snake River spring/summer Chinook salmon in the mainstem Salmon River tributaries between the Lemhi River and the Middle Fork Salmon River, an area that includes the Panther Creek Watershed (NMFS 2002).

The exceptionally large numbers of adult Chinook salmon that returned to the Snake River Basin from 2001 to 2004 are thought to be a result of favorable ocean conditions (Logerwell *et al.* 2003; Meengs and Lackey 2005), and above average flows in the Columbia River Basin (CRB) when the smolts migrated downstream. However, the species continues to be challenged by the impact of mainstem hydroelectric development that alters flow regimes and competition between natural indigenous stocks and hatchery stocks that increases the proportion of fish with hatchery heritage. Habitat is degraded in some areas, with lack of pools, increased water temperatures, low flows, and high sediment loads. Harvest impacts are generally low (BRT 2003). Additional information on the species is available in the Chinook salmon status review (BRT 2003) and the Salmon Subbasin Assessment (NPCC 2004).

The population of Snake River spring/summer Chinook salmon in the Panther Creek Watershed has been reduced, in part, due to the effects of mining in the area, especially in the Blackbird Creek subwatershed. In the Panther Creek Watershed, some sources document the extirpation of endemic Chinook salmon by the 1970s, but hatchery fish have been stocked in the watershed several times (ICBTRT 2003). Historically, Chinook salmon generally spawned up to Porphyry Creek but spawning gravels are also available upstream (Murphy 1962). As shown in Figure 1, Chinook salmon also used the lowest portions of several tributaries for rearing and significant portions of Moyer Creek and Clear Creek for spawning (Rose 2005). Chinook salmon spawning occurs beginning the last week of August through September, with incubation extending through the following April (USBWP Technical Team 2005).

The Idaho Department of Fish and Game (IDFG) outplanted 1,000 adult Snake River spring/summer Chinook salmon of hatchery origin in 2001 to attempt to restore the Panther Creek population. The Shoshone-Bannock Tribes conducted a Chinook redd ground survey in 2001 and found 43 completed redds between Moyer Creek and Deep Creek. Seven of the 43 redds were observed between Blackbird Creek and Deep Creek. Panther Creek below Deep Creek was documented as being too turbid for spawning that year (Kutchins 2001). A few Chinook salmon also spawned in lower Musgrove and Moyer creeks in 2001 (Rose 2005). In 2004 and 2005, the IDFG conducted aerial redd counts of Panther Creek between the confluences with Clear Creek and Cabin Creek. In 2004, the IDFG observed one Chinook salmon redd, which was between Moyer Creek and Deep Creek (IDFG 2004a). In 2005, the IDFG observed 18 Chinook salmon redds that were all downstream of Moyer Creek (IDFG 2005). Populations of juvenile Chinook salmon have been documented in Panther Creek and several tributaries (including Moyer, Musgrove, Porphyry, Blackbird, and Deep creeks) over the last few years by the IDFG and the Shoshone-Bannock Tribes (IDFG 2004b; SBT 2004). Some juvenile Chinook salmon rearing occurs in the lowest reaches of Panther Creek (Rose 2005). The total potential Snake River spring/summer Chinook salmon production capability for the Panther Creek Watershed is 252,700 smolts within 92.5 stream miles of historic occupied habitat (NPPC 1995).

Figure 1. Presence of Chinook Salmon and Steelhead in Panther Creek Watershed



Snake River Basin Steelhead

The Snake River Basin steelhead Distinct Population Segment, listed as threatened on January 5, 2006 (71 FR 834), includes all naturally-spawned anadromous *Oncorhynchus mykiss* populations below natural and manmade impassable barriers in streams in the Snake River Basin of southeast Washington, northeast Oregon, and Idaho, as well six artificial propagation programs that have fish that are genetically no more than moderately divergent from natural populations. The species was formerly listed as the Snake River Basin steelhead ESU (August 18, 1997, 62 FR 43937).

The Snake River Basin is believed to have produced up to half of the steelhead in the CRB historically, but natural runs have been declining in abundance over the past several decades (BRT 2003). Counts of wild and hatchery-origin steelhead returning to the Snake River Basin declined sharply in the early 1970s, increased modestly from the mid 1970s through the 1980s, and declined again during the 1990s (Fish Passage Center 2004). Some of the significant factors in the declining populations are mortality associated with the many dams along the Columbia and Snake Rivers, losses from harvest, loss of access to more than 50 percent of their historic range, and degradation of habitats used for spawning and rearing. Possible genetic introgression from genetically-different hatchery stocks is another threat since wild fish comprise such a small proportion of the steelhead populations. Very little is still known about interactions between co-occurring resident and anadromous forms of *O. mykiss* (BRT 2003).

The longest consistent indicator of steelhead abundance in the Snake River Basin is derived from counts of natural-origin steelhead at the uppermost dam on the lower Snake River. According to these estimates, the abundance of natural-origin summer steelhead at Lower Granite Dam declined from a 4-year average of 58,300 in 1964 to a 4-year average of 8,300, ending in 1998. The 4-year average from 2001-2004 is 46,652 wild fish, which make up 23 percent of the total adult returns (COE 2005). These large returns are thought to be largely a result of cyclic oceanic and climatic conditions favorable to anadromous fish (Logerwell *et al.* 2003; Meengs and Lackey 2005). Researchers have not yet determined if the recent population increases represent a shift in the population growth rates (due to a corresponding shift in climatic conditions), or if the change is a temporary phenomenon. Factors other than ocean conditions, such as downstream passage conditions for smolts, predation, fishing pressure, and habitat conditions in rearing areas also vary from year to year, and may offset gains from favorable ocean conditions in some years, or work synergistically in others.

The numbers of steelhead are still low in comparison to interim target species recovery levels for the Snake River Basin. The annual targets include a spawning aggregation of 21,600 steelhead for the Salmon River Basin over an 8 year average (NMFS 2002). Additional information on the species is available in the steelhead status review (BRT 2003), and in the Salmon Subbasin Assessment (NPCC 2004).

The population of Snake River Basin steelhead in the Panther Creek Watershed has been reduced, in part, due to the effects of mining in the area, especially in the Blackbird Creek

subwatershed. In the Panther Creek Watershed, some sources document the extirpation of endemic steelhead by the 1950s, but hatchery fish have been stocked in the watershed several times (ICBTRT 2003). Historically, steelhead are believed to have spawned and reared almost to the headwaters of Panther Creek, as shown in Figure 1. Chinook salmon and steelhead also used the lowest portions of several tributaries for rearing and significant portions of Moyer Creek and Clear Creek for spawning (Rose 2005). Steelhead spawning occurs from the middle of March to the middle of May, with incubation extending through the middle of July (USBWP Technical Team 2005).

The Shoshone-Bannock Tribes, in cooperation with the IDFG and the SCNF, have performed a steelhead fry reintroduction program over the last several years to augment the recovery of steelhead in the Panther Creek Watershed (Denny, pers. com. 2004). Varying numbers of juvenile steelhead have been documented in Panther Creek and some tributaries over the last few years by the IDFG and the Shoshone-Bannock Tribes (IDFG 2004b; SBT 2004). During the spring of 2004, the Shoshone-Bannock Tribes performed a steelhead redd count survey and found no redds within Panther Creek for a 3 mile reach from Musgrove Creek in the UPCS to Dummy Creek in the MPCS (Denny, pers. com. 2005). The total potential steelhead production capability for Panther Creek and its tributaries is 65,080 smolts within 145 stream miles of historic occupied habitat (NPPC 1995).

2.1.2. Status of Critical Habitat

NMFS reviews the status of critical habitat affected by the proposed action by examining the condition and trends of primary constituent elements (PCEs) throughout the designated area. Within the action area, critical habitat has been designated for Snake River spring/summer Chinook salmon and Snake River Basin steelhead.

The PCEs consist of the physical and biological elements identified as essential to the conservation of the species in the documents designating critical habitat. The species addressed in this Opinion share many of the same rivers and estuaries and have similar life history characteristics and, therefore, many of the same PCEs. These PCEs include sites essential to support one or more life stages of the species (sites for spawning, rearing, migration, and foraging). They also contain physical or biological features essential to the conservation of the species, such as spawning gravels, water quality and quantity, side channels, and forage species.

At the time that each habitat area was designated as critical habitat, that area contained one or more PCEs within the acceptable range of values required to support the biological processes for which the species use that habitat.

Snake River Spring/Summer Chinook Salmon Designated Critical Habitat

Critical habitat was designated for Snake River spring/summer Chinook salmon on December 28, 1993 (58 FR 68543), and was revised on October 25, 1999 (64 FR 57399). Most

of the Panther Creek Watershed is designated critical habitat. Critical habitat is designated in the Upper Salmon Subbasin to include all river reaches presently or historically accessible to Snake River spring/summer Chinook salmon. The area above Napias Falls, which is less than a mile from the mouth of Napias Creek, is specifically excluded in the critical habitat designation. Critical habitat includes the bottom and water of the waterways and the adjacent riparian zone, which is defined as the area within 300 feet of the normal line of high water of a stream channel or from the shoreline of a standing body of water.

Essential critical habitat features for Snake River spring/summer Chinook salmon spawning and juvenile rearing areas include adequate: (1) Substrate/spawning gravel; (2) space; (3) riparian vegetation; (4) water temperature; (5) water quality; (6) food; (7) water quantity; and (8) cover/shelter. Essential critical habitat features for Snake River spring/summer Chinook salmon migration include the features listed for spawning and rearing, except spawning gravel, and also include: (1) safe passage conditions and (2) water velocity. Food is not an essential feature for migrating adults.

Habitat impairment is common in the range of this species. Spawning and rearing habitats are likely impaired by factors such as tilling, water withdrawals, timber harvest, grazing, mining, and alteration of floodplains and riparian vegetation. Mainstem Columbia River and Snake River hydroelectric developments have altered flow regimes and estuarine habitat, and disrupted migration corridors.

Several of the listed essential features are not sufficiently available in the Panther Creek Watershed. Water quality has been degraded due to the effects of mining, especially in Blackbird and Napias creeks. Panther Creek below the Blackbird Creek confluence also has degraded water quality that may present a barrier to fish passage during low flow periods (Rose 2005). Water quantity may also be insufficient in sections of Panther Creek during the irrigation season. Sediment levels, as measured through sediment core samples, are elevated in some areas of the watershed. Water temperatures also are elevated in some sections of Panther Creek and its tributaries, probably due to irrigation withdrawals.

Snake River Basin Steelhead Designated Critical Habitat

Critical habitat for Snake River Basin steelhead was designated on September 2, 2005 (70 FR 52630). Critical habitat extends up to nearly the headwaters of Panther Creek and includes fairly large segments of the following Panther Creek tributaries: Porphyry Creek; Musgrove Creek; Moyer Creek, including a small portion of South Fork Moyer Creek; Woodtick Creek; Big Deer Creek; Trail Creek; Beaver Creek; and Clear Creek. Approximately 1 mile or less of the lowest portions of the following Panther Creek tributaries are also included as critical habitat: Opal Creek; Cabin Creek; Copper Creek; Fawn Creek; Spring Creek; Deep Creek; Little Deer Creek; and Garden Creek. Designated critical habitat includes the stream channel, with a lateral extent as defined by the ordinary high-water line; the bankfull elevation is used in areas where ordinary high-water line has not been defined.

NMFS identified six specific types of sites and their associated features: (1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development; (2) freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks; (3) freshwater migration corridors free of artificial obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival; (4) estuarine areas free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and juvenile and adult forage, including aquatic quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; (5) nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as subermerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and (6) offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

The Snake River Basin Critical Habitat Analytical Review Team (Review Team) concluded that all occupied areas contain spawning, rearing, or migration PCEs for this species. Of the nine watersheds used by the Review Team for the Panther Creek Watershed, the Review Team rated five with a high conservation value. The lowest portions of the Panther Creek Watershed, including Napias Creek received medium and low ratings for conservation value (NMFS 2005).

The complex life cycle of steelhead gives rise to complex habitat needs, particularly during the freshwater phase (Spence *et al.* 1996). Spawning gravels must be of a certain size and free of sediment to allow successful incubation of the eggs. Eggs also require cool, clean, and well-oxygenated waters for proper development. Juveniles need abundant food sources, including insects, crustaceans, and other small fish. They need places to hide from predators (mostly birds and bigger fish), such as under logs, root wads and boulders in the stream, and beneath overhanging vegetation. They also need places to seek refuge from periodic high flows (side channels and off channel areas) and from warm summer water temperatures (coldwater springs and deep pools). Returning adults generally do not feed in fresh water but instead rely on limited energy stores to migrate, mature, and spawn. Like juveniles, they also require cool water and places to rest and hide from predators. During all life stages steelhead require cool water that is free of contaminants. They also require rearing and migration corridors with adequate passage conditions (water quality and quantity available at specific times) to allow access to the various habitats required to complete their life cycle.

The Review Team identified several management activities that have affected the PCEs in the Panther Creek Watershed, including mineral mining; road building and maintenance; irrigation impoundments and withdrawals; grazing; forestry; and agriculture. Effects to the PCEs from grazing and irrigation withdrawals primarily occur in the upper portions of the watershed. Mining and roads have affected the PCEs in most parts of the watershed. Effects to the PCEs from forestry and agriculture are limited to smaller areas (NMFS 2005).

2.2. Environmental Baseline

The "environmental baseline" includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02). For projects that are ongoing actions, the effects of future actions over which the Federal agency has discretionary involvement or control will be analyzed as "effects of the action."

NMFS describes the environmental baseline in terms of the biological requirements for habitat features and processes necessary to support life stages of the subject species within the action area. When the environmental baseline departs from those biological requirements, the adverse effects of a proposed action on the species or its habitat are more likely to jeopardize the ESA-listed species or result in destruction or adverse modification of critical habitat (NMFS 1999).

The biological requirements of salmon and steelhead in the action area vary depending on the life history stage present and the natural range of variation present within that system (NRC 1996; Spence *et al.* 1996). During spawning migrations, adult salmon generally require clean water with cool temperatures and access to thermal refugia, dissolved oxygen near 100 percent saturation, low turbidity, adequate flows and depths to allow passage over barriers to reach spawning sites, and sufficient holding and resting sites. Fish select spawning areas based on species-specific requirements of flow, water quality, substrate size, and groundwater upwelling. Embryo survival and fry emergence depend on substrate conditions (*e.g.*, gravel size, porosity, permeability, and oxygen concentrations), substrate stability during high flows, and cold water temperatures (*i.e.*, 55°F or less for most species). Habitat requirements for juvenile rearing include seasonally suitable microhabitats for holding, feeding, and resting. Migration of juveniles to rearing areas, whether the ocean, lakes, or other stream reaches, requires access to these habitats. Physical, chemical, and thermal conditions may all impede migrations of adult or juvenile fish.

Each species considered in this Opinion resides in or migrates through the action area. Thus, for this action area, the biological requirements for salmon and steelhead are the habitat characteristics that would support successful adult and juvenile migration, adult holding, spawning, incubation, rearing, and growth and development to smoltification. The biological

requirements likely to be affected by the proposed actions are substrate/sediment, space, riparian vegetation, water temperature, water quality, food, and safe passage conditions. These habitat characteristics are the PCEs that are the basis of the effects analysis. Water quantity is also discussed in this section due to the effects water withdrawals have had on environmental baseline conditions. Information about the habitat characteristics examined in this section of the Opinion is partly derived from the analysis in the BA of the 19 pathways and indicators developed by NMFS (1996).

The Panther Creek Watershed lies in the Middle Salmon-Panther Subbasin and includes four fifth field HUCs: the UPCS (67,514 acres or 105.5 square miles), the MPCS (139,495 acres or 217.9 square miles), the NCS (54,929 acres or 85.8 square miles), and the LPCS (84,247 acres or 131.6 square miles). There are approximately 400 miles of perennial streams in the Panther Creek Watershed, and most streams are mid- to high-gradient. The watershed is characterized by many steep, narrow drainages. High-intensity storms occur frequently in the summer, which may produce major landslides or intensely-burning fires.

Human activities that have degraded aquatic habitats or affected native fish populations in the Panther Creek Watershed include mining, construction of roads (including culverts), water diversions for irrigation, livestock grazing, timber harvest, fire exclusion and suppression, outdoor recreation, noxious weed introduction and treatments, and limited amounts of development. Natural events, such as landslides and fire are likely intensified and made uncharacteristic due to human influences. Land management and development activities have: (1) elevated fine sediment yields; (2) reduced vegetation that retains stable banks and vegetative canopy that minimizes solar heating of streams; (3) degraded water quality; (4) eliminated fish passage in certain reaches; (5) reduced connectivity (*i.e.*, the flow of energy, organisms, and materials) between streams, riparian areas, floodplains, and uplands; (6) altered flow volumes and timing; (7) reduced large woody material that traps sediment, stabilizes stream banks, and helps form pools; and (8) altered channels, making them incised and separated from the floodplain in certain areas. Some human activities, such as culvert removal projects and burned area emergency rehabilitation (BAER) activities, have reduced these effects. Overall, many of the instream, riparian, and watershed indicators described in the BA are functioning at levels of risk, especially in certain parts of the Panther Creek Watershed. Although water quality is improving, it continues to impair fish viability in the watershed.

Several actions are not included for section 7 consultation in the BA, but they are considered in the evaluation of the status of the environmental baseline. The BA does not include 37 ongoing water diversion actions in the Panther Creek Watershed that are going through a separate consultation process. The Blackbird Mine Cleanup actions are occurring. Plans for a future cobalt mine located within the historic Blackbird mining area on SCNF-administered lands are being developed by Formation Capital Corporation. Consultations for fire suppression, routine road maintenance, routine trail maintenance, and noxious weed control activities were previously completed through programmatic consultations. In addition, consultation is being completed for the Deep Creek culvert replacement. The SCNF and U.S. Environmental Protection Agency

determined there would be "no effect" on Chinook salmon and steelhead from the Beartrack Mine Reclamation action, including potential downstream effects from a point source discharge in Napias Creek.

Environmental baseline conditions within the action area are described below at the level of fifth field HUCs and according to affected habitat characteristics. Full descriptions of management activities and natural characteristics are provided in the BA, but are summarized as background material. Tables 2 through 8 are based on information in the BA (Rose 2005). Sediment data collected by the SCNF are compared to standards developed for the SCNF that define appropriate function as areas with less than 20% fines of smaller than ¼-inch diameter in quartzite geologies and areas with less than 25% fines of smaller than ¼-inch diameter in granitic, volcanic, and sedimentary geologies. PACFISH does not provide comparable sediment standards. Water temperature data collected by the SCNF are compared to standards for temperatures found in PACFISH (USDA and USDI 1995). The PACFISH water temperature standards for appropriate function are 60°F for spawning and 64°F for rearing and migration.

2.2.1. Upper Panther Creek Subwatershed (UPCS)

The UPCS covers 82,809 acres and is located on the southeast side of the Panther Creek Watershed, with the lower end approximately 26 miles from the mouth of Panther Creek. The UPCS has 103 perennial stream miles, which include Cougar Creek, Johnly Gulch, Mink Creek, Opal Creek, Otter Creek, Panther Creek, and Weasel Creek in the Panther Headwaters subwatershed; Cabin Creek, South Fork Cabin Creek, Corral Creek, Fourth of July Creek, and Panther Creek in the Panther-Cabin subwatershed; Porphyry Creek, South Fork Porphyry Creek, and Panther Creek in the Panther-Porphyry subwatershed; Musgrove Creek and Ostrander Creek in the Musgrove Creek subwatershed; and Blue Creek, Moyer Creek, South Fork Moyer Creek, and Salt Creek in the Moyer Creek subwatershed. The land is primarily managed by the SCNF, but 6 stream miles are on private land.

The UPCS has been affected primarily by grazing and irrigation water withdrawals (NMFS 2005). Grazing allotments cover the majority of the UPCS (see Section 1.2.1), and grazing occurs on 4 miles of Panther Creek on private land. There are 10 major surface water withdrawals that combine to 20.14 cfs and 55 very small withdrawals that combine to 2.12 cfs. This is greater than the mean monthly flow for most months in this section of Panther Creek. Panther Creek diversions 5 and 6, which are on private land along Panther Creek downstream of Opal Creek, were consolidated in 2004. On SCNF-managed land, proposals have been considered to reduce water losses and improve fish passage at Panther Creek diversions 1-4 and Cabin Creek Diversion 1.

Other activities have also affected the UPCS, including fire, roads, timber harvest, mining, weed treatments, and recreation. The Clear Creek and Aparejo fires burned 16,172 acres in the UPCS in 2000, mostly affecting the upper half of Musgrove Creek and the west bank of Panther Creek

from Porphyry Creek to a couple miles upstream of Cabin Creek. The UPCS has been impacted by 31.7 miles of roads located within 300 feet of perennial streams; timber harvested from 5,587 acres since 1972; limited amounts of mining, with 60 acres of patented mining claims in the Musgrove Creek subwatershed; regular treatment of weeds (30 acres in 2004, including 5 acres in riparian areas); limited levels of recreation, with 38 miles of trails, 15-20 dispersed camping sites, two toilets, and a few private cabins; and a few administrative facilities. The SCNF has implemented 13 watershed improvement projects since 1989, which include riparian livestock exclosures and culverts that provide fish passage.

The habitat indicators identified in the BA are functioning appropriately for most parts of the UPCS. Stream reaches in the UPCS are not on the 1998 303(d) list of impaired stream segments for the Middle Salmon-Panther Creek Subbasin (IDEQ 2001). The habitat characteristics that have identified risks include substrate/sediment, space, riparian vegetation, water temperature, safe passage conditions, and water quantity. The risks to these habitat characteristics in the UPCS are described below.

Substrate/Sediment

Turbidity and substrate embeddedness data have not been collected in the UPCS. Based on sediment core data presented in Table 2, the Moyer Creek and Musgrove Creek subwatersheds have some risks associated with sediment, but there are no obvious long-term trends. Other stream segments have had high sediment levels for a single year, but otherwise are within acceptable levels. Levels of sediment in the Musgrove Creek subwatershed have a risk of being high due to the fires in 2000. The 2000 fires present risks to the Panther-Cabin and Panther-Porphyry subwatersheds to a lesser extent. Roads in riparian areas also present sediment risks; 4.4 percent of the 31.7 miles of riparian roads encroach on floodplains and may increase sediment delivery. Sediment delivery may be elevated in 2 of 31 survey stream reaches that have stream bank stabilities below 80 percent: the lowest segment of Panther Creek in the UPCS and South Fork Moyer Creek.

Table 2. Sediment Levels Measured by SCNF in UPCS Compared to SCNF Sediment Standards*

SUBWATERSHED	SITE (DOMINANT GEOLOGY)	SED STND (%)	PERCENT FINES (< 0.25")											
			'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04
Panther Headwaters	Panther Cr. below Opal Cr. (Q)	20				22.6	12.8	13.7	16.4	19.8	22.9	18.0		
	Panther Cr. above Silver Cr. Rd. (V)	25			13.0	24.6	11.1	14.5	13.5	19.7	20.0	24.1	25.5	
Panther-Porphyry	Mouth of Porphyry (Q)	20	20.8	19.9				10.4	15.3	22.3	16.1	17.0		18.1
	Panther Cr. above Musgrove Cr. (V)	25	27.7	24.2	28.0	30.3	19.6	18.0	23.6	24.0	19.3	18.4	22.9	17.7
Musgrove Creek	Mouth of Musgrove (Q)	20	13.2	17.8	24.5	28.0	12.4	4.9	10.6	21.4	15.9	17.2	14.4	21.8
Moyer Creek	Mouth of Moyer (Q)	20	19.0	22.9	22.0	23.2	18.8	17.4	14.7	25.0	24.8	23.1	11.5	15.1
	Moyer Cr above South Fork (Q)	20	17.0	25.7		26.7	15.4	12.7	23.4					12.7
	Mouth of South Fork (Q)	20	26.2	23.6										18.6

*Standards for the SCNF for appropriate function are less than 20% in quartzite (Q) geologies and less than 25% fines in granitic (G), volcanic (V), and sedimentary (S) geologies. Shaded boxes do not meet standards.

Space

The SCNF considers the pool frequency and availability of off-channel habitat to be functioning at risk. Based on surveys, 18 of 33 reaches meet Overton *et al.* (1995) natural conditions for pool frequency, which are more stringent than PACFISH. Between 6 percent and 11 percent of surveyed streams consist of side-channel and backwater habitat. Quality of existing habitat is good and provides refugia for all live stages of fish.

Riparian Vegetation

The SCNF considers riparian areas in the UPCS to be functioning at risk but with an upward trend. Musgrove Creek is considered to be functioning appropriately. Short reaches totaling less than 2 miles of perennial streams are considered to be in downward trends, including segments of Moyer, Blue, and Fourth of July creeks and McGowan Gulch (Rose 2005). The SCNF considers eight of nine range riparian evaluation sites to meet standards for mid-seral or higher that are explained in the Salmon Land and Resource Management Plan (Forest Plan) (SNF 1988). Riparian areas are adversely affected by 31.7 miles of riparian roads. Riparian areas are also affected by two stream reaches with stream bank stabilities below 80 percent: the lowest segment of Panther Creek in the UPCS and the South Fork of Moyer Creek. The amount of

cover provided by large woody debris is at levels of risk, with only 6 of 20 surveyed stream reaches meeting natural conditions described in Overton *et al.* (1995), which are more stringent than PACFISH. Large woody debris is more abundant in forest reaches of Panther Creek than in meadow reaches.

Water Temperature

As shown in Table 3, the main location in the UPCS that is functioning at risk from elevated temperatures is Panther Creek above Porphyry Creek up to Opal Creek. The mouths of Musgrove and Moyer creeks also have somewhat high temperatures. However, there are no obvious long-term trends. The water temperature data are based on the 7-day running maximum temperatures, which are measured annually. Water diversions in the UPCS may contribute significantly to the high water temperatures.

Table 3. 7-Day Maximum Temperatures (in Fahrenheit) Measured by the SCNF in UPCS Compared to PACFISH Standards*

SUBWATERSHED	SITE	PAC-FISH STND	YEAR										
			'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03
Panther Headwaters	Panther Cr. above Silver Cr. Road	60	57			61	62	62	59.3		61.7	61.6	63.0
	Panther Cr. above Opal Cr.	60			54	56	56	58	56.6	61.6	60.9	60.8	62.4
	Panther Cr. above Otter Cr.	--								59.2		56.1	54.3
	Mouth of Opal	64								54.1	53.3	49.8	53.4
	Mouth of Weasel	64								53.1		51.5	53.2
	Mouth of Otter	--								52.7	49.7	50.3	51.3
Panther-Cabin	Mouth of Cabin	64							54.8	59.9	54.9	59.6	58.4
	Mouth of Fourth of July	64							55.0	58.9	58.1	57.2	59.9
Panther-Porphyry	Mouth of Porphyry	60	58	58	56	55	55	57	55.6	58.9	58.4	58.0	58.7
	Panther Cr. above Porphyry Cr.	60			62		62		63.4	66.8	66.3	67.1	68.3
Musgrove Creek	Mouth of Musgrove	60	56	61	57	57	58	61		61.4	62.7	62.4	61.3
Moyer	Mouth of Moyer	60	55	60	57	58	58	58	59.2	62.6	61.9	65.2	62.8
	Moyer Cr. above South Fork	60								55.9		54.3	56.7
	Mouth of South Fk.	64								59.3	57.4	59.8	61.5

*PACFISH water temperature standards for appropriate function are 60°F for spawning and 64°F for rearing and migration. Shaded boxes do not meet standards.

Safe Passage Conditions

The UPCS has no identified physical barriers in areas accessible to anadromous fish. However, water diversions remove water from the UPCS and could impede fish passage, but the SCNF has not observed fish passage problems related to the diversions.

Water Quantity

In the UPCS, there are 10 major surface water withdrawals and 55 very small withdrawals that combine to 22.26 cfs, which is greater than the mean monthly flow for most months in this section of Panther Creek. These diversions can operate from early April through the fall. Based on a survey of the diversions on SCNF-administered lands in July 2002, no single diversion removed more than 27 percent of the surface water flow. The lowest flow measured on Panther Creek was 6.97 cfs, and flow was 11.7 cfs upstream of the Moyer Creek confluence with Panther Creek. Based on information in the BA, the overall greatest impact of the water withdrawals is on Otter Creek, portions of Panther Creek, and South Fork Moyer Creek. The SCNF considers the Musgrove Creek subwatershed to be at risk for changes to peak and base flows due to the 2000 fires.

2.2.2. Middle Panther Creek Subwatershed (MPCS)

The MPCS covers 117,710 acres, with the lower end approximately 14 miles from the mouth of Panther Creek. The MPCS has 122 perennial stream miles, which include Copper Creek, Dummy Creek, and Panther Creek in the Panther-Copper subwatershed; Woodtick Creek in the Woodtick Creek subwatershed; Blackbird Creek, West Fork Blackbird Creek, and Meadow Creek in the Blackbird Creek subwatershed; Cliff Creek, Fawn Creek, Spring Creek, and Panther Creek in the Panther-Fawn subwatershed; Deep Creek, Little Deep Creek, Pepper Creek, an unnamed creek near Hunter Springs in the Deep Creek subwatershed; Big Jureano Creek, Little Jureano Creek, Little Deer Creek, Quartz Gulch, and Panther Creek in the Panther-Little Deer subwatershed; and Big Deer Creek, South Fork Big Deer Creek, and Bucktail Creek in the Big Deer Creek subwatershed. The land is primarily managed by the SCNF, but 6 stream miles are on private land. Approximately 10 percent (11,598 acres) of the MPCS in the upper half of the Big Deer Creek subwatershed is designated wilderness.

The MPCS has been affected primarily by mining and roads (NMFS 2005). There are 909 acres of patented mining claims, with the Blackbird Mine in the Blackbird Creek, Panther-Little Deer, and Big Deer Creek subwatersheds; the Blackpine Mine in the Panther-Copper and Panther-Fawn subwatersheds; the Panther Creek Inn claim in the Panther-Fawn subwatershed; and the Little Deer Creek claim in the Panther-Little Deer subwatershed. Mining, especially at the Blackbird Mine, has impaired water quality and several stream segments are on the 1998 303(d) list. A variety of cleanup activities have been completed at the Blackbird Mine to improve water quality and restore anadromous fish runs. Agreements are ongoing between Federal agencies, the state of Idaho, and the Blackbird Mine Site Group to meet cleanup objectives. Plans for additional mining at the Blackbird Mine site are being developed by Formation Capital Corporation, which has conducted active cobalt exploration since 1995. The MPCS has 271 miles of roads, with 41 road miles along perennial streams. Two culverts create barriers to fish passage on Deep Creek and Woodtick Creek. The Woodtick Creek culvert replacement is part of the proposed action; consultation has occurred previously on the Deep Creek culvert replacement.

Other activities have also affected the MPCS, including fire, grazing, timber harvest, weed treatments, recreation, and water withdrawals. The Clear Creek and Aparejo fires burned 60,292 acres in the MPCS in 2000, affecting almost the entire subwatershed on the west bank of Panther Creek. Smaller fires have also burned in the MPCS. The MPCS has been impacted by grazing on the entire area on the east bank of Panther Creek (see Section 1.2.1); timber harvested from 7,159 acres since 1972; regular treatment of weeds (54 acres in 2004, including 9 acres in riparian areas); recreation, with 59 miles of trails, 12-15 dispersed camping sites, three toilets, and a few private cabins; water withdrawals that combine to 1.36 cfs; and a few SCNF-managed facilities. The SCNF has implemented five watershed improvement projects since 1981, which include boulder placements to enhance instream cover and a drift fence. The BAER projects were implemented following the 2000 fires in several areas, including along Panther Creek, Deep Creek, and Blacktail Creek.

Several of the habitat indicators identified in the BA are functioning at risk in the MPCS. The habitat characteristics that have identified risks include substrate/sediment, space, riparian vegetation, water temperature, water quality, food, safe passage conditions, and water quantity. The risks to these habitat characteristics in the MPCS are described below.

Substrate/Sediment

Turbidity and substrate embeddedness data have not been collected in the MPCS. Based on sediment core data in Table 4 and observations by the SCNF, the areas identified in the BA as having risks associated with sediment are Blackbird, Little Deep, Big Deer, and Panther creeks. However, levels of sediment are at risk of being high due to the 2000 fires in most of the MPCS, except the Deep Creek and Woodtick Creek subwatersheds and portions of the Panther-Fawn and Panther-Copper subwatersheds. Sediment levels went up in the years following the fires, but there are no obvious long-term trends through 2004. Roads in riparian areas also present sediment risks; roads along Panther, Copper, and Blackbird creeks encroach on the streams for most of their length, which may increase sediment delivery. Sediment delivery may be elevated in 3 of 18 survey stream reaches that have stream bank stabilities below 80 percent: two reaches of the upper portions of Panther Creek in the MPCS and a reach in lower Woodtick Creek.

Table 4. Sediment Levels Measured by SCNF in MPCS Compared to SCNF Sediment Standards*

SUBWATERSHED	SITE (DOMINANT GEOLOGY)	SED STND (%)	PERCENT FINES (< 0.25")											
			'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04
Woodtick Creek	Mouth of Woodtick (Q)	20	9.7	9.0	10.8	10.6			17.2		18.3			
Blackbird Creek			No Data											
Panther–Fawn			No Data											
Deep Creek	Mouth of Deep Cr. (Q)	20	14.8	8.2	10.4	19.7	8.3	13.9	12.0	21.5	14.9	16.2	11.3	15.1
	Little Deep Cr. above FR #231 (Q)	20									35.1	29.4	35.9	27.9
Big Deer Creek	Big Deer Cr above South Fork (G)	25									23.5	29.6	26.1	24.4
	Big Deer Cr below South Fork (G)	25									30.7	29.0	14.8	17.8
	Mouth of Big Deer (Q)	20	9.7	15.3	29.4		26.9		19.0		23.4		23.4	

*Standards for the SCNF for appropriate function are less than 20% in quartzite (Q) geologies and less than 25% fines in granitic (G), volcanic (V), and sedimentary (S) geologies. Shaded boxes do not meet standards.

Space

The SCNF considers pool frequency, availability of off-channel habitat and refugia to be functioning at risk, except on Woodtick Creek and Big Deer Creek. Based on surveys, five of 18 reaches meet Overton *et al.* (1995) natural conditions for pool frequency. Most areas have low percentages of off-channel habitat, which has been further reduced by road encroachment and stream channeling on private land. Refugia are limited because of water quality degradation and physical barriers. Width-to-depth ratios do not meet Overton *et al.* (1995) natural conditions for Panther Creek below Blackbird Creek and for Blackbird Creek.

Riparian Vegetation

Riparian areas are affected by 41 miles of riparian roads that run along Panther, Copper and Blackbird creeks. The only range riparian evaluation site in the MPCS is on Little Deep Creek, and it meets Forest Plan standards for late-seral conditions. Riparian areas have been affected by grazing along upper Deep Creek, Little Deep Creek, upper Copper Creek, and upper Spring Creek. Riparian areas are also affected by three stream reaches with stream bank stabilities below 80 percent: two reaches of the upper portions of Panther Creek in the MPCS and a reach in lower Woodtick Creek. The 2000 fires burned riparian vegetation throughout the MPCS on the west bank of Panther Creek. The amount of cover provided by large woody debris is at levels of risk, with only 7 of 18 surveyed stream reaches meeting Overton *et al.* (1995) natural conditions; the Blackbird Creek subwatershed was not surveyed. The amount of large woody debris increased in parts of the MPCS affected by the 2000 fires.

Water Temperature

As shown in Table 5, in the MPCS, Panther Creek and Blackbird Creek are functioning at risk from elevated temperatures, but there are no obvious long-term trends. Temperatures are most elevated in Panther Creek. The water temperature data are based on the 7-day running maximum temperatures, which are measured annually.

Table 5. 7-Day Maximum Temperatures (in Fahrenheit) Measured by the SCNF in MPCS Compared to PACFISH Standards*

SUBWATERSHED	SITE	PAC-FISH STND	YEAR										
			'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03
Woodtick Creek	Mouth of Woodtick	64		53	51	51	52			51.7	52.1	53.4	53.4
Blackbird Creek	Mouth of Blackbird	64			64	65	64	66	62.7	65.0	64.8	66.4	66.1
Panther–Fawn	Panther Cr. above Napias	60	59	67	60	62	61	64	63.1	66.8	67.2	66.9	68.4
	Panther Cr. above Deep Cr.	60	60	69	61		62			67.4	68.6	68.5	69.5
Deep Creek	Mouth of Deep Cr.	60	52	56	53	55	54	56	55.8	58.4	57.4	58.3	59.9
	Deep Cr. above FR #101	64							51.6				
	Mouth of Little Deep Cr.	64				54	53		54.0	58.4	54.0	56.0	56.1
Panther–Little Deer	Panther Cr. above Big Jureano Cr.	60		67	62		64	64		65.3	66.2	67.7	68.6
Big Deer Creek	Mouth of Big Deer	64				63	58		57.6	60.7	63.2	63.8	64.7

*PACFISH water temperature standards for appropriate function are 60°F for spawning and 64°F for rearing and migration. Shaded boxes do not meet standards.

Water Quality

In the MPCS, several stream segments are on the1998 303(d) list of impaired stream segments: Blackbird Creek below the mine, Panther Creek below the confluence with Blackbird Creek, Bucktail Creek, South Fork Big Deer Creek, and Big Deer Creek below the South Fork Big Deer Creek (IDEQ 2001). These segments are on the 303(d) list due to unacceptable levels of pH, metals, and sediment. Blackbird Creek also contains elevated levels of iron that may violate narrative water quality standards for toxic and deleterious substances (IDEQ 2001). Degraded water quality from mining resulted in the loss of approximately 30 miles of aquatic habitat in local streams and the associated runs of anadromous fish. Remediation efforts are ongoing and water quality has improved dramatically. However, many of the aquatic life needs are not being met for ESA-listed salmonids and the water quality problems have created a chemical barrier to fish.

Food

Aquatic biota that provide prey items for fish are likely affected by the water quality problems in Blackbird Creek below the mine, Panther Creek below the confluence with Blackbird Creek, Bucktail Creek, South Fork Big Deer Creek, and Big Deer Creek below the South Fork Big Deer. Although not quantified, any reduction in available food also limits the number of fish that these streams can support.

Safe Passage Conditions

Water quality problems below Blackbird Creek and Big Deer Creek essentially blocked fish migration up and down Panther Creek for several years. However, conditions are improving, and Chinook salmon were observed spawning below Blackbird Creek in 2001 following the IDFG adult outplants. There is also a natural cascade located approximately 600 meters up Big Deer Creek that may block upstream fish migration. Other migration barriers include three structures related to the Blackbird Mine have been placed on lower West Fork Blackbird Creek and Blackbird Creek upstream and downstream of the Meadow Creek confluence. Two culverts create barriers to fish passage on Deep Creek and Woodtick Creek. The Woodtick Creek culvert replacement is part of the proposed action; consultation has occurred separately on the Deep Creek culvert replacement.

Water Quantity

The SCNF considers the portions of the MPCS burned by the 2000 fires to be at risk for changes to peak and base flows. Water withdrawals that total 1.36 cfs have a minimal effect on available water quantity.

2.2.3. Napias Creek Subwatershed (NCS)

The NCS covers 56,390 acres and is located on the northeast side of the Panther Creek Watershed. The confluence of Napias Creek with Panther Creek is approximately 18.5 miles from the mouth of Panther Creek. The area above Napias Falls, which is less than a mile from the mouth of Napias Creek, is specifically excluded from designated Chinook salmon critical habitat, and the entire length of Napias Creek is excluded from designated steelhead critical habitat. Fish are currently considered incapable of moving above Napias Falls. However, the effects of actions occurring above this point have the potential to affect downstream habitat and are the focus of the following discussion on existing conditions. The NCS has 69 perennial stream miles, which include Camp Creek, Jefferson Creek, Napias Creek, Sawpit Creek, Sharkey Creek, and Smith Gulch in the Upper Napias Creek subwatershed; Arnett Creek, Goldbug Creek, and Rapps Creek in the Arnett Creek subwatershed; Missouri Gulch, Napias Creek, Phelan Creek, Pony Creek, and Rabbit Creek in the Napias-Phelan subwatershed; and Cutler Creek, Mackinaw Creek, Napias Creek, and Moccasin Creek in the Lower Napias Creek subwatershed. The land is primarily managed by the SCNF, but approximately 7 stream miles are on private land.

The NCS has been affected primarily by mining, roads, timber harvest, and agriculture (grazing, ranching, and irrigation) (NMFS 2005). There are 39 acres of patented mining claims and placer mining occurred historically, which caused erosion in some areas. The 648-acre Beartrack Mine, located in the Upper Napias Creek subwatershed between Jefferson and Arnett creeks, produced gold ore from 1994 to 2000. Closure and reclamation is occurring and is scheduled to be

completed by 2006. The NCS has 149 miles of roads, with 26 road miles along perennial streams. Timber has been harvested from 4,989 acres in the NPS since 1972. Grazing allotments cover the majority of the NCS (see Section 1.2.1). Livestock graze the 1,006-acre Coiner Ranch along Phelan Creek, which is adjacent to the Coiner Allotment. There are nine major surface water withdrawals that combine to 15.03 cfs and 21 very small withdrawals that combine to 0.63 cfs. This total is greater than the mean monthly flow for 5 months in Napias Creek. The greatest impact of these withdrawals is on Phelan Creek, Pony Creek, and Rabbit Creek, which are all in the Napias-Phelan subwatershed.

Other activities have also affected the NPS, including fire, weed treatments, and recreation. The Clear Creek and Aparejo fires burned 19,080 acres in the NCS in 2000, affecting almost the entire subwatershed on the northwest bank of Napias Creek. The UPCS has been impacted by regular treatment of weeds (19 acres in 2004, including 4 acres in riparian areas); limited levels of recreation, with 16 miles of trails, eight dispersed camping sites, one toilet, and a few cabins; and two SCNF-managed historic sites. The SCNF has implemented seven watershed improvement projects since 1989, which include riparian exclosures, culvert replacements, and decommissioning roads.

Only a few of the habitat indicators identified in the BA are functioning appropriately for the NCS. Stream reaches in the NCS are not on the 1998 303(d) list of impaired stream segments for the Middle Salmon-Panther Creek Subbasin (IDEQ 2001). The habitat characteristics that have identified risks below Napias Falls include substrate/sediment, space, and water temperature. The risks to these habitat characteristics in the NCS are described below.

Substrate/Sediment

Turbidity and substrate embeddedness data have not been collected in the NCS. Based on sediment core data, most areas of the NCS have risks associated with sediment. However, data have not been collected in the lowest section of Napias Creek, where anadromous fish are present. Levels of sediment have a risk of being high due to the fires in 2000 on the northwest bank of Napias Creek, but no long-term trends have been identified. Roads in riparian areas also present sediment risks; 28 percent of the 26.1 miles of riparian roads encroach on floodplains and may increase sediment delivery. Sediment delivery may be elevated in eight of 11 survey stream reaches that have stream bank stabilities below 80 percent. Reaches along upper Napias Creek, Sawpit Creek, Cat Creek, Phelan Creek, and Moccasin Creek have localized areas of unstable banks from past mining and grazing.

Space

The SCNF considers pool frequency, availability of off-channel habitat, and refugia to be functioning at risk for the one section below Napias Falls where data were collected, based on natural conditions for pool frequency as described in Overton *et al.* (1995). However width-to-depth ratios are within natural conditions in this section.

Water Temperature

As shown in Table 6, the mouth of Napias Creek is functioning at risk for water temperatures, but there are no obvious long-term trends. The water temperature data are based on the 7-day running maximum temperatures, which are measured annually. Upstream temperatures are not shown, but the water diversions upstream of Napias Falls are likely a major factor that contributes to the high water temperatures at the mouth of Napias Creek.

Table 6. 7-Day Maximum Temperatures (in Fahrenheit) Measured by the SCNF in NCS Compared to PACFISH Standard for Spawning

SUBWATERSHED	SITE	PAC-FISH STND	YEAR										
			'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03
Lower Napias Creek	Mouth of Napias	60	60	64	62	63	66		63.0	62.7	60.9	66.8	64.5

*PACFISH water temperature standards for appropriate function are 60°F for spawning and 64°F for rearing and migration.
Shaded boxes do not meet standards.

2.2.4. Lower Panther Creek Subwatershed (LPCS)

The LPCS covers 83,742 acres on the northwestern side of the Panther Creek Watershed, with the lower end at the mouth of Panther Creek. The LPCS has 106 perennial stream miles, which include Panther Creek, Trail Creek, Bridge Creek, Grant Creek, Squaw Camp Creek, and Birch Creek in the Panther-Trail subwatershed; Beaver Creek in the Beaver Creek subwatershed; Garden Creek, Panther Creek, Squaw Gulch, Bear Gulch, and Hot Springs Creek in the Panther-Garden subwatershed; and Clear Creek, Rancherio Creek, Cougar Creek, and Deadhorse Creek in the Clear Creek subwatershed. The land is primarily managed by the SCNF, but approximately five stream miles are on private land. Approximately half (41,837 acres) of the LPCS is designated wilderness, including most of the Clear Creek subwatershed and the Garden Creek portions of the Panther-Garden subwatershed.

The LPCS has been affected primarily by mining, roads, and water withdrawals; these activities generally have not affected the Clear Creek subwatershed (NMFS 2005). The Beaver Creek subwatershed has been the most affected by mining, and all 114 acres of patented mining claims are in that subwatershed. The length of Panther Creek through the LPCS is on the 1998 303(d) list for metals due to poor water quality associated with the Blackbird Mine in the MPCS (IDEQ 2001). The LPCS has 59.3 miles of roads, with 18.7 road miles along perennial streams. There are four major surface water withdrawals that combine to 4.4 cfs and 16 very small withdrawals that combine to 1.98 cfs; these withdrawals are all in the Beaver Creek and Panther-Garden subwatersheds. A withdrawal from Hot Springs Creek can completely dewater the creek, but high water temperatures preclude salmonid use of Hot Springs Creek.

Other activities have also affected the LPCS, including fire, recreation, weed treatments, timber harvest, and grazing. The Clear Creek and Aparejo fires burned 73,716 acres in the LPCS in 2000, affecting almost the entire area of the LPCS. A few smaller fires, including prescribed

burns, have also affected the LPCS. The LPCS has been impacted by recreation, with 99 miles of trails, three dispersed trailheads, 7-10 dispersed camping sites, two toilets, and a few private cabins; regular treatment of weeds (129 acres in 2004, including 17 acres in riparian areas); timber harvested from 1,713 acres since 1972; grazing on a small area in the LPCS that the SCNF considers to be spatially separated from water bodies; and SCNF operation of the Bacon Ranch. The SCNF has implemented a few watershed improvement projects since 1979, including a culvert replacement, boulder placements to enhance instream cover, riparian plantings, and floodplain restoration. A project may be proposed in the future to relocate the lower portion of the Panther Creek road away from the floodplain to minimize sediment delivery. The BAER projects were implemented following the 2000 fires in several areas, including along Panther Creek and Hot Springs Creek. The BAER efforts focused on weed control and planting of annual vegetation, but included some directional tree felling and removal of flood hazards.

Several of the habitat indicators identified in the BA are functioning at risk in the LPCS. The habitat characteristics that have identified risks include substrate/sediment, space, riparian vegetation, water temperature, water quality, food, safe passage conditions, and water quantity. The risks to these habitat characteristics in the LPCS are described below.

Substrate/Sediment

Turbidity and substrate embeddedness data have not been collected in the LPCS. Based on sediment core data in Table 7 and observations by the SCNF, Panther Creek is identified in the BA as having risk associated with sediment. Some drainages have had elevated sediment levels in certain years due to high intensity thunderstorms, but spring runoff events have removed the excess sediment. Sediment loads also may be elevated due to the 2000 fires in almost all of the LPCS, but there are no obvious long-term trends through 2004. Roads in riparian areas also add to sediment risks; roads along Panther, Beaver, and Hot Springs creeks encroach on the streams, which may increase sediment delivery. Sediment delivery may be elevated in several stream reaches due to reduced bank stability following significant thunderstorms and debris torrents in 2002 and 2003.

Table 7. Sediment Levels Measured by SCNF in LPCS Compared to SCNF Sediment Standards*

SUBWATERSHED	SITE	SED STND (%)	YEAR											
			'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04
Panther–Trail	Panther Cr. Below Gant Creek (V/G)	25	25.2	27.8	28.7	26.0	23.2	27.4	29.8	29.5	29.5	29.9	30.2	25.1
	Mouth of Trail (Q)	20	9.9	26.5							10.9	15.3	14.0	16.6
Beaver Creek	Mouth of Beaver (Q)	20	37.8	14.8				10.9		28.5	19.6	28.0	13.4	
Panther–Garden	Panther Cr. Below Clear Cr. (V/G)	25								30.6	31.8	48.9	25.0 **	25.9
	Panther Cr. Above Clear Cr. (V/G)	25	32.8	25.2	23.8	23.0	16.4	25.2	31.5	27.5	29.3	32.6	33.4 **	22.2
	Mouth of Garden (G)	25	15.7	20.1							17.6	18.9		14.6
Clear Creek	Mouth of Clear (G)	25	34.3	31.2	14.3	24.8	5.5	8.7	17.2	14.3	82.5	83.0	30.2	
	Mouth of Clear Near Corrals (G)	25	40.4	29.5								75.3	14.0	

*Standards for the SCNF for appropriate function are less than 20% in quartzite (Q) geologies and less than 25% fines in granitic (G), volcanic (V), and sedimentary (S) geologies. Shaded boxes do not meet standards.
** Core samples taken before the 2003 blowouts and debris torrents

Space

The SCNF considers pool frequency, availability of off-channel habitat, and refugia to be at levels of risk, except on Beaver Creek and Trail Creek. Many of the pool formative features (*i.e.*, boulders, large woody debris) were removed during debris torrents in 2002 and 2003, but large woody debris may increase through recruitment of fire-killed trees. Most areas of the LPCS have low percentages of off-channel habitat, which has been further reduced by road encroachment and stream channeling on private land. Refugia are limited in Panther Creek because of water quality degradation and physical barriers, but are likely available in tributaries. Width-to-depth ratios likely do not meet natural conditions described by Overton *et al.* (1995) in Panther, Clear, and Garden creeks, mostly due to the debris torrents in 2002 and 2003 (Rose 2005).

Riparian Vegetation

Riparian areas are affected by 18.7 miles of riparian roads that run along Panther, Beaver, and Hot Springs creeks. The 2000 fires affected riparian areas in most of the LPCS, but vegetation is recovering in these areas. Riparian areas along Panther Creek have been negatively affected by acid rock drainage from the Blackbird Mine, riprap placement and stream channelizing, past grazing, and fire. Based on a survey in 1991, the amount of cover provided by large woody

debris was functioning at risk, with only one of 11 stream reaches meeting natural conditions as described in Overton *et al.* (1995). The amount of large woody debris available in the short-term likely increased in most of the LPCS due to the 2000 fires. Riparian vegetation and associated bank stability may not be functioning appropriately due to reduced bank stability following significant thunderstorms and debris torrents in 2002 and 2003.

Water Temperature

As shown in Table 8, in the LPCS, Panther, Clear, Beaver, and Garden creeks are functioning at risk from elevated temperatures, but there are no obvious long-term trends. Temperatures are most elevated in Panther Creek and Clear Creek. Based on an SCNF study, some of the elevated temperatures may be natural in Panther Creek (Rose 2005). Clear Creek and Garden Creek temperatures increased following the 2000 fires. The water temperature data are based on the 7-day running maximum temperatures, which are measured annually.

Table 8. 7-Day Maximum Temperatures (in Fahrenheit) Measured by the SCNF in LPCS Compared to PACFISH Standards*

SUBWATERSHED	SITE	PAC-FISH STND	YEAR										
			'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03
Panther–Trail	Panther Cr. near Fritzer Gulch	60	60	67	62		62	64	63.1		67.2	66.5	68.4
	Mouth of Trail	64							63.8	63.4	66.9	63.0	60.0
Beaver Creek	Mouth of Beaver	60	56	60	57	58	59	61	61.3	60.9	62.2		
Panther–Garden	Mouth of Panther	60	64				70	74	68.3	70.3	69.0		
	Mouth of Garden	64									64.2		
Clear Creek	Mouth of Clear	60	58	63	58	58	58	61	61.3		70.5		

*PACFISH water temperature standards for appropriate function are 60°F for spawning and 64°F for rearing and migration. Shaded boxes do not meet standards.

Water Quality

The length of Panther Creek through the LPCS is on the 1998 303(d) list for metals due to poor water quality associated with the Blackbird Mine in the MPCS (IDEQ 2001). This segment meets state water quality standards for dissolved oxygen and pH. Remediation efforts are ongoing and water quality has improved dramatically, but improvements are still needed to restore healthy populations of ESA-listed salmonids.

Food

Aquatic biota that provides prey items for salmonids may be affected by the water quality problems in Panther Creek related to the Blackbird Mine. Tributaries to Panther Creek should be unaffected.

Safe Passage Conditions

Water quality problems through the length of Panther Creek in the LPCS essentially blocked fish migration up and down Panther Creek for several years. However, conditions are improving and some fish are returning to the area. Clear Creek has several rock drops and head cuts due to debris torrents in 2002 and 2003, but these potential migration barriers should be reduced naturally by channel forming flows during spring runoff events.

Water Quantity

In the LPCS, there are four major surface water withdrawals and 16 very small withdrawals, which combine to 6.38 cfs. A withdrawal from Hot Springs Creek can completely dewater the creek, but high water temperatures preclude salmonid use of Hot Springs Creek. More than half of the flow from Beaver Creek can be legally withdrawn. Diversions on other creeks are allowed a smaller proportion of the overall flow. Except for the Hot Springs Creek withdrawals, most diversions can operate from April to November. The SCNF considers the LPCS to be at risk for changes to peak and base flows due to the 2000 fires.

2.3. Effects of the Action

"Effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). If the proposed action includes offsite measures to reduce net adverse effects by improving habitat conditions and survival, NMFS will evaluate the net combined effects of the proposed action and the offsite measures as interrelated actions.

"Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification; "interdependent actions" are those that have no independent utility apart from the action under consideration (50 CFR 402.02). Future Federal actions that are not a direct effect of the action under consideration, included in the environmental baseline, or treated as indirect effects are not considered in this Opinion.

"Indirect effects" are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR 402.02). Indirect effects may occur outside the area directly affected by the action, and may include other Federal actions that have not undergone Section 7 consultation but will result from the action under consideration.

The actions in the Panther Creek Watershed that are proposed in this consultation will likely have direct and indirect effects to the PCEs, which include substrate/sediment, space, riparian vegetation, water temperature, water quality, food, and safe passage conditions. Activities that are interrelated and interdependent to implementation of the proposed actions in the Panther Creek Watershed are not anticipated.

Based on the analysis of effects in the BA and environmental baseline conditions, NMFS concurs with the SCNF determination of "not likely to adversely affect" for all of the actions except grazing in the Forney Allotment and the Prairie Basin Unit, the culvert removal at Fourth of July Creek, the culvert removal and ford installation at Woodtick Creek, the ford installation at the Birch Creek Trailhead, and continued use of the Clear Creek ford. Portions of the Deer-Iron, Coiner, and Diamond-Moose Creek allotments and Unit 1 of the Morgan Creek Allotment within the Panther Creek Watershed, and the Mackinaw Creek culvert removal project will have discountable effects to the species because these actions occur outside of areas occupied by Chinook salmon and steelhead (as described in Section 2.1). The Deep Creek Campground, the McDonald Flat Campground, and the special use permit for the transmission line involve low impact activities that are further reduced by conservation measures, so these actions involve insignificant effects to the species that would not be able to be meaningfully evaluated. The effects of the Williams Basin-Napias Creek Allotment are discountable to the species because cattle are unable or not allowed to graze in spawning areas, which are along Panther Creek and the lowest section of Deep Creek; effects to juvenile fish are considered insignificant because conservation measures reduce the effects, which would not be meaningfully measured.

The Coiner Allotment, portions of the Diamond-Moose Creek Allotment in the Panther Creek Watershed, and the Mackinaw Creek culvert removal project are entirely within the NCS, which is not designated critical habitat for Chinook salmon or steelhead. The portion of Unit 1 of the Morgan Creek Allotment in the Panther Creek Watershed is in the headwaters away from riparian areas, so effects of the action on critical habitat should not be meaningfully measurable. The Deep Creek Campground, the McDonald Flat Campground, and the special use permit for the transmission line involve low impact activities that are not anticipated to have measurable effects to critical habitat. Portions of the Deer-Iron and Williams Basin-Napias Creek allotments in the Panther Creek Watershed have insignificant effects to critical habitat because many riparian buffers are in place, conservation measures such as drift fences are used, and conditions are improving compared to the environmental baseline.

The effects of the Forney Allotment, portions of the Prairie Basin Unit within the Panther Creek Watershed, the culvert removal projects, and the fords are explained below and summarized at the end of Section 2.3.1."

Several effects are likely to occur within the proposed grazing allotments (Platts 1991; summarized in Spence *et al.* 1996). Livestock grazing may cause direct effects to fish when livestock enter streams to loaf, drink, or cross the stream. Specifically, livestock can trample redds and destroy or dislodge embryos and alevins. Over time, woody and hydric herbaceous vegetation along a stream can be reduced or eliminated, and livestock trampling causes stream banks to collapse. Without vegetation to slow water velocities, hold the soil, and retain moisture, flooding causes more erosion of stream banks; the stream becomes wider and shallower and in some cases downcut; the water table drops; and hydric, deeply rooted herbaceous vegetation dies out and is displaced by upland species with shallower roots and less ability to bind the soil. The resulting instability in water volume, increased summer water temperature, loss of pools and

habitat adjacent and connected to stream banks, and increased substrate fine sediment and cobble-embeddedness adversely affect steelhead, Chinook salmon, and their habitats. Livestock also introduce nutrient matter to water bodies when they graze adjacent to or cross streams.

The culvert removal and ford installation actions require instream construction activities, which include instream operation of heavy machinery and exposure of large areas of bare soil. This will produce turbidity plumes sufficient to cause harm and harassment of any ESA-listed fish present during construction activities and potentially during subsequent high flow events. Potential effects include mortality from exposure to suspended sediments (turbidity) or contaminants, and behavioral changes resulting from elevated turbidity levels (Sigler *et al.* 1984; Berg and Northcote 1985) during instream construction. Water temperatures may rise and prey availability may fall over the short-term until riparian vegetation is reestablished. There is a small possibility that fish could come in direct contact with equipment or construction materials, causing injury or death. The proposed bypass channels will provide fish passage during construction. Spawning adults and active redds will be protected by conducting instream work between July 15 and August 15 or after a stream survey confirms the work area is free of adult salmonids and active redds. Use of the fords is likely to mobilize sediment and reduce riparian vegetation over the short-term.

2.3.1. Effects on ESA-Listed Species

The action, as proposed, is reasonably likely to have the following direct and indirect effects on ESA-listed species and their habitats. Effects from direct contact with fish are discussed, and specific habitat effects, which include substrate/sediment, space, riparian vegetation, water temperature, water quality, food, and safe passage conditions are discussed below. The effects from direct contact with fish and habitat effects encompass both direct and indirect effects. Although steelhead and Chinook salmon are not currently found in all parts of the Panther Creek Watershed, an underlying assumption for this analysis is that ongoing restoration efforts will reestablish populations in accessible portions of the watershed as defined in Figure 1.

Chinook salmon and steelhead may be directly affected by the proposed grazing allotment, culvert removal, and ford installation actions. Direct effects to fish would occur when equipment or livestock come in direct contact with salmonids or when the proposed actions result in alterations to normal salmonid behavior.

The Forney Allotment and Prairie Basin Unit may cause direct effects to anadromous salmonids. Direct effects may occur when livestock enter the streams occupied by salmonids to loaf, drink, or cross the stream. During the early phases of their life cycle, steelhead and Chinook salmon have little or no mobility, and large numbers of embryos or young are concentrated in small areas. Livestock can trample redds and destroy or dislodge embryos and alevins. Human wading in streams with active redds can kill a significant portion of eggs and pre-emergent fry (Roberts and White 1992), and livestock wading is assumed to have similar effects. The period of time considered free of spawning steelhead, Chinook salmon, and their redds in the Panther

Creek Watershed is July 16 to August 22 (USBWP Technical Team 2005), and some grazing occurs outside of these times. Exclosure fences protect or will protect spawning areas from cattle grazing, except along Panther Creek upstream of the Fourth of July Creek confluence on the Forney Allotment and three reaches between Opal Creek and Cabin Creek on the Prairie Basin Unit. Grazing will also occur along Panther Creek and Moyer Creek at two riparian pastures. These portions of Panther and Moyer creeks have not been used for anadromous spawning since the populations' decline caused by the Blackbird Mine. Spawning anadromous fish are beginning to return to areas below these reaches and some spawning may occur in these unprotected areas if fish populations are restored. Because Chinook salmon are not currently building redds in these upper reaches, no redds are likely to be damaged by the grazing actions. However, if Chinook salmon use these reaches for spawning, reinitiation would be required. Additionally, a small possibility exists that livestock may come into direct contact with rearing salmonids, causing harm or death. Grazing that alters salmonid behavior, such as frightening individual fish away from cover, is difficult to analyze sufficiently for a large-scale grazing program. Some behavior modifications are likely to occur if livestock graze riparian areas along stream reaches or drink where salmonids are present.

The culvert removal at Fourth of July Creek, the culvert removal and ford installation at Woodtick Creek, and the ford installation at the Birch Creek Trailhead, all may cause direct effects to salmonids. Due to timing, only juvenile life stages of Chinook salmon and steelhead should be affected during the implementation phases of the three specified actions. If areas are dewatered, salmonids are likely to be harmed or killed, even if appropriate precautions are taken during a fish salvage operation. For example, the IDFG salvaged 2,886 juvenile Chinook salmon and steelhead in 31 separate operations within the Lemhi River Watershed in 2003 (Resseguie 2004). Of these, 2,729 were non-lethal take. The salvage area for the three instream construction projects will be much smaller on average than for operations conducted by the IDFG. Also, juvenile Chinook salmon and steelhead densities are lower in the Panther Creek Watershed. Based on these assumptions, a reasonable estimate of non-lethal take (salvage) for the salvage efforts on each of the three instream construction projects would be 10 juvenile Chinook salmon or steelhead. Additionally, NMFS anticipates that lethal take resulting from the action will be no more than one juvenile Chinook salmon or steelhead. The instream work and use of the fords following installation may also cause fish to flee the disturbed area.

Although not currently considered a problem, as Chinook salmon and steelhead populations increase, adult fish may build redds in the gravels in the reach where there is an unhardened ford at the Clear Creek Trailhead (Rose 2005). Any redds formed in the ford could be crushed by vehicles using the fords, and vehicles may frighten individual fish away from the ford area. Steelhead would not be affected by this threat because the ford is not used during periods of high water, which coincide with incubation. Because Chinook salmon are not currently building redds in the area of this ford, no redds are likely to be damaged by continued use of the ford. However, if Chinook salmon use the ford areas at the Clear Creek Trailhead for spawning, reinitiation would be required and ford use would need to be suspended.

Substrate/Sediment and Space

Effects to substrate and space are anticipated from the proposed actions. Sediment inputs that exceed the river's transport ability can become embedded in spawning gravels, which reduces salmonid egg and alevin survival, or the suitability of gravels for future spawning (Spence *et al.* 1996). Excess sedimentation and deposition may also damage overwintering habitat and pools that act as cover for fry and juveniles, alter production of macroinvertebrate prey species, and reduce total pool volume (various studies summarized in Spence *et al.* 1996). Increased sediment load can be detrimental to juvenile salmonids not only by causing siltation, but also by introducing suspended particulate matter that interferes with feeding and territorial behavior (Sigler *et al.* 1984; Berg and Northcote 1985). However, limited amounts or short-term pulses of sediment may not always have significant effects because the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes have been shown to have limited impacts to adult and larger juvenile salmonids (Bjornn and Reiser 1991).

Substrate/sediment and space will be affected by grazing on the Forney Allotment and Prairie Basin Unit. Livestock often trample stream banks and subsequent erosion adds fine sediments to stream substrates. As described in Section 1.2.1, rest-rotation systems have been established on the grazing allotments to reduce the effects to sediment that livestock have on a given unit. Sediment mobilization is also reduced with the placement of upland watering troughs. Fourth of July Creek is at risk due to the concentration of grazing in the area but proposed fencing to be installed by fall 2007 should help resolve potential problems. Sediment is likely to be introduced to the water column when livestock are present in riparian areas and sediment may affect spawning gravels. Mobilized sediment would likely be at low magnitudes, affect small areas, and last for short periods of time. Although herd numbers in riparian areas are limited, bank stabilities and pool habitat may also be at risk based on the intensity and duration of livestock impacts. Areas affected would likely be small, but destablized banks would likely remain unstable for an extended period of time. Implementation of the SCNF adaptive management strategy for grazing within riparian ecosystems (Gamett *et al.* 2005) should improve progress toward adequate substrate/sediment and space.

The culvert removal at Fourth of July Creek, the culvert removal and ford installation at Woodtick Creek, and the ford installation at the Birch Creek Trailhead, involve instream and near water construction that will cause short-term adverse habitat effects and potentially result in harassment or harm of juvenile Chinook salmon and steelhead. Instream work will last up to three days for each project, and the use of best management practices (BMPs) will help protect fish that may be present by limiting the amount of sediment introduced to the water column. Any turbidity plumes resulting from project implementation are not expected to be greater in length than 500 yards or last more than 8 hours. Construction activities will be timed to avoid adult salmonids and their active redds. Excess sediment that becomes embedded in the substrate will likely wash away during high flow periods. Effects to sediment and space are not expected to be of sufficient magnitude to significantly impair habitat or food sources; fish should be able to escape to downstream refugia. Sediment effects may continue until stream banks are

revegetated. All of the fords may cause sediment mobilization following installation. Short segments of stream bank are already being destabilized by use of the unarmored ford that crosses Panther Creek at the Clear Creek Trailhead and this erosion will likely continue.

Riparian Vegetation and Water Temperature

Effects to riparian vegetation and water temperature are anticipated from the proposed actions. Woody riparian vegetation provides large wood to streams, which helps create rearing and spawning areas. Riparian vegetation also provides water quality functions (*e.g.*, temperature control and nutrient transformation), bank stability, detritus (insect and leaf input, small wood for substrate for insects), microclimate formation, floodplain sediment retention and vegetative filtering, and recharge of the stream hyporheic zone (Spence *et al.* 1996). An eastern Oregon watershed study by Maloney *et al.* (1999) found that watersheds with 75% or greater surface shade maintain acceptable stream temperature standards for steelhead and Chinook salmon. Rearing temperature requirements vary for salmonids, with preferred temperatures between 50° F and 57° F and upper lethal temperatures for Chinook salmon and steelhead at 75° F and 79° F, respectively (studies summarized in Bjornn and Reiser 1991). In addition to the lethal effects of high temperatures, salmonids rearing at temperatures near the upper lethal limit have decreased growth rates because nearly all consumed food is used for metabolic maintenance (Bjornn and Reiser 1991).

Riparian vegetation and water temperature will likely be affected by grazing on the Forney Allotment and Prairie Basin Unit. When riparian vegetation is removed by grazing, sunlight reaching streams increases which leads to cumulative increases in downstream temperatures (Barton *et al.* 1985). Streams in areas that are improperly grazed are wider and shallower than in ungrazed systems, exposing a larger surface area to incoming solar radiation (Bottom *et al*. 1985; Platts 1991). Grazing pressure can alter plant communities, and early seral stage communities provide limited protection for the watershed and stream banks because root systems are not fully developed. Regardless of seral stage, at least 4-6 inches of residual stubble or regrowth is recommended to meet the requirements of plant vigor maintenance, bank protection, and sediment entrapment (Clary and Webster 1989). Effects to vegetation will be minimized through the use of stubble height utilization standards. Additionally, effects to riparian vegetation and temperature are minimized with the placement of upland watering troughs and proposed fencing projects. Implementation of the SCNF adaptive management strategy for grazing within riparian ecosystems (Gamett *et al.* 2005) should improve progress toward adequate riparian vegetation and water temperature.

The culvert removal at Fourth of July Creek, the culvert removal and ford installation at Woodtick Creek, and the ford installation at the Birch Creek Trailhead, will require some removal of riparian vegetation that will affect the banks in these small areas over the short-term. These areas will be replanted, but water temperatures may rise slightly until vegetation is reestablished. However, the effects on water temperature from these actions are not likely to be measurable. Riparian vegetation is likely affected and will continue to be affected by bank erosion at the Clear Creek Trailhead ford.

Water Quality

Effects to water quality are anticipated from the proposed actions. Water quality must be adequate to support the biological functions of salmonids. Blackbird Creek and the middle and lower sections of Panther Creek already have severely degraded water quality.

Water quality may be affected by grazing on the Forney Allotment and Prairie Basin Unit. Organic nutrient enrichments of water bodies and reduction of streamside vegetation by cattle grazing within the Panther Creek Watershed may reduce water quality. In general, grazing can result in changes in the magnitude and timing of nutrient inputs and increases in fecal coliform bacteria (Spence *et al.* 1996). This is compounded where water temperatures are elevated because increases in biological oxygen demand are accompanied by decreases in dissolved oxygen content. Effects to water quality from the proposed grazing will likely occur at low magnitudes over the long-term and will be reduced with the placement of upland watering troughs and the installation of additional fences.

Water quality may be affected by the culvert removal at Fourth of July Creek, the culvert removal and ford installation at Woodtick Creek, and the ford installation at the Birch Creek Trailhead. Heavy equipment will be used for project implementation in and near the culvert removal and ford installation projects. As with all construction activities, accidental releases of fuel, oil, and other contaminants may occur. Petroleum-based contaminants contain polycyclic aromatic hydrocarbons, which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic sublethal effects to aquatic organisms (Neff 1985). Staging and refueling areas will be at least 150 feet away from the creek to prevent any direct effects to salmonids. Emergency spill containment equipment will be available at all times to manage any petroleum product spills or leaks. Any spill from the culvert removal would likely be relatively small and be contained before spreading across a large area. A spill could have some long-term effects, depending on the type of substance involved in the spill, but the effects would be expected to decrease over time. The risk of a spill of sufficient magnitude to be lethal to salmonids is highly unlikely and the conservation measures minimize those risks.

Food

Effects to food are anticipated from the proposed actions. Rearing salmonids feed primarily on aquatic and terrestrial invertebrates (Spence *et al.* 1996). Increases in water temperatures (up to the thermal optimum) and dissolved oxygen levels generally correlate with increases in feeding (Spence *et al.* 1996). Excess fine and suspended sediment can reduce the habitat for prey items, which affects the abundance of food (Spence *et al.* 1996). Removal of riparian vegetation can reduce habitat for terrestrial and aquatic insects (Platts 1991).

Food will likely be affected by the grazing and instream actions. Fine sediment resulting from livestock-trampled banks and other effects of grazing can reduce benthic invertebrate abundance and diversity, even over the short-term (Scrimgeour and Kendall 2003). Grazing may also result

in increased stream temperatures and reductions in riparian vegetation that affect aquatic insect communities. Mobilization of sediment and reductions in riparian vegetation that occur through the instream actions may also affect the abundance of prey for salmonids. These effects to food from the actions will likely occur over the long-term, but may be difficult or impossible to measure where actions are confined to a small geographic area. As the actions are confined to a small area, overall effects on the species are also expected to be small.

Safe Passage Conditions

Safe passage conditions may be affected by the proposed actions. Safe passage conditions are achieved when water quantity, quality, and velocity are within a range that allows for natural migratory behavior. Natural and artificial obstacles can also create barriers or partial barriers to fish migration.

The proposed intensity of grazing combined with proposed conservation measures are likely to prevent adverse conditions, such as high levels of sediment, that would limit fish passage. The culvert removal and ford installation projects are designed to improve passage conditions, but there will be short-term adverse sediment effects that may alter safe passage conditions. Due to project timing, only juvenile life stages of Chinook salmon and steelhead should be affected. Fish passage will be maintained throughout implementation of these projects. Migratory Chinook and steelhead will not be present during project implementation. The levels of sediment generated should be such that fish could escape to available refugia downstream. The BMPs will limit the amount of sediment introduced to the water column and the extent of turbidity plumes. Instream work will last up to three days for each project. Restoration of stream reaches where the projects will occur should improve fish passage by simulating the natural stream gradient and width. Fish passage should improve, compared to present conditions, once the projects are complete.

Summary of Effects on ESA-Listed Species

The primary effects that are likely to adversely affect Chinook salmon and steelhead include take associated with salvage operations during instream work activities; threats to spawning fish and their redds in Panther and Moyer creeks from cattle on the Forney and Morgan Creek allotments; threats to spawning Chinook salmon and their redds in Panther Creek at the Clear Creek Trailhead ford; short-term increases in sediment from the instream work activities; and potential for chemical contamination from the instream work activities.

An incremental change in the likelihood of survival and recovery for the species considered in this consultation due to the proposed actions cannot be quantified. However, based on the effects described above, it is reasonably likely that the proposed actions will have relatively small negative effects, with positive effects over the long-term resulting from the habitat improvement projects. Overall, the proposed action will likely have small net negative effects in the Panther Creek Watershed compared to a future projection of environmental baseline

conditions without implementation of the actions. The negative effects are limited both in their magnitude and spatial extent, as described in the analysis above, and are not likely to cause an appreciable reduction in the likelihood of survival and recovery of the species.

2.3.2. Effects on Critical Habitat

The action, as proposed, is likely to have the following direct and indirect effects on critical habitat.

As described in Section 2.3.1 above, anticipated effects on PCEs from the proposed actions in the Panther Creek Watershed include effects to substrate/sediment, space, riparian vegetation, water temperature, water quality, food, and safe passage conditions. The actions will cause some reductions in the conservation value of the designated critical habitat. The negative effects of the construction projects (*i.e.*, culvert removal, ford installation, trail building) will primarily be short-term in nature. The grazing allotments will likely have some harmful effects to habitat over the long-term, but these effects will be combined with effects of other actions in the watershed, and the significance of these effects is difficult to gage based on environmental baseline information provided in the BA. However, the SCNF is minimizing continued habitat degradation by altering grazing rotations. The SCNF is also implementing its adaptive management strategy for grazing within riparian ecosystems (Gamett *et al.* 2005), which will substitute, when appropriate, grazing management and long-term monitoring habitat indicators for stubble height standards. The SCNF also is working to restore habitat by removing fish passage barriers caused by the culverts and eliminating a toilet that may leach nutrients into groundwater at the Deep Creek Campground. Based on the positive and negative effects to habitat, the conservation value of the critical habitat will likely remain constant, with some potential small improvements over time.

These changes will primarily affect the rearing habitat of juvenile Chinook salmon and steelhead. The changes will also have effects on migration habitat of juveniles and adults for both species. There is a small possibility that the changes will affect spawning and incubation habitat for both species. Across the Panther Creek Watershed, the effects of the proposed actions are not reasonably likely to reduce the capacity of those habitat features to meet conservation needs of the affected species.

An incremental change in the conservation value of a critical habitat within the action area due to the proposed actions cannot be quantified. However, based on the effects described above, it is reasonably likely that the proposed actions will have a small net negative effect over the long-term compared to a future project of environmental baseline conditions without implementation of the actions. However, based on the magnitude and spatial extent of these negative effects, the conservation value of the critical habitat will not be appreciably diminished.

2.4. Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Cumulative effects that reduce the capacity of ESA-listed species to meet their biological requirements in the action area increase the risk to the species that the effects of the proposed action on the species or its habitat will result in jeopardy (NMFS 1999).

Very little private land is located in the Panther Creek Watershed. However, state-authorized water withdrawals from diversion points significantly impact fishery resources. Water will likely continue to be withdrawn from the watershed, resulting in reduced flows. The Snake River Basin Adjudication, water leases, or increased rainfall may result in increased availability of flows. Ranching activity on private lands will likely continue with no change in intensity. Mining exploration, operation, and reclamation activities are also likely to continue. The overall effects from mining are likely to improve over the long-term because reclamation goals include restoration of Chinook salmon runs. Additionally, future mining activities will likely be structured to reduce effects on fishery resources.

Between 1990 and 2000, the population of Lemhi County increased by 13.1 percent, but between 2000 and 2004, the population increased by less than 1 percent (U.S. Census Bureau 2005). Population densities are lower in the Panther Creek Watershed than in the rest of Lemhi County and there is a high proportion of public lands, so growth would likely occur more slowly. NMFS assumes that future private and state actions will continue within the action area at a fairly stable rate, but that increases in these actions will occur as population density rises. If the human population in the action area grows, demand for agricultural, commercial, or residential development and outdoor recreation is also likely to grow. Substantial growth and development would likely reduce the conservation value of habitat within the action area.

Quantifying an incremental change in survival for the species and in the conservation role of critical habitat considered in this consultation due to cumulative effects is not possible. Based on the overall goal of restored Chinook salmon runs in the Panther Creek Watershed, especially in mining actions, it is reasonably likely that cumulative effects within the action area will have a net positive effect on the likelihood that these species will survive and recover, and a net positive effect on the conservation role of critical habitat. The duration of cumulative effects and magnitude of the contribution to the species and critical habitat cannot be determined by NMFS.

2.5. Conclusion

After reviewing the best available scientific and commercial information regarding the biological requirements and the status of the species considered in this Opinion, the environmental baseline for the action area, the effects of the proposed actions, and the cumulative effects, NMFS concludes that the actions, as proposed, are not likely to jeopardize the continued existence of these species. Similarly, based on a review of the best available scientific and commercial

information regarding the status of the designated critical habitat considered in this Opinion, the environmental baseline for the action area, the effects of the proposed actions, and the cumulative effects, NMFS concludes that the actions, as proposed, are not likely to destroy or adversely modify designated critical habitat.

These conclusions are based on the following considerations: (1) Ongoing actions have been modified to make improvements to environmental baseline conditions, (2) construction actions generally have short-term negative effects that are reduced by the utilization of BMPs and are offset by long-term benefits, (3) risks are relatively low for lethal take, and any lethal or non-lethal take would be small and distributed over a large geographic area, which should limit population effects, and (4) based on goals to restore Chinook salmon in the watershed, habitat conditions are likely to improve over the long-term.

2.6. Conservation Recommendation

Section 7 (a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. NMFS has no conservation recommendations.

2.7. Reinitiation of Consultation

Reinitiation of formal consultation is required and shall be requested by the Federal agency or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If the amount or extent of taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect ESA-listed species or critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that has an effect to the ESA-listed species or critical habitat that was not considered in the biological opinion; (d) if a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16); or (e) if there is a downward trend for water temperature or sediment habitat indicators within designated critical habitat for four consecutive years (4 years is a sufficient length of time to establish a trend).

To reinitiate consultation, contact the Idaho State Habitat Office of NMFS and refer to the NMFS Number assigned to this consultation.

3. ENDANGERED SPECIES ACT – INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the ESA prohibits the taking of listed species without a specific permit or exemption. Protective regulations adopted pursuant to Section 4(d) extend the prohibition to threatened species (July 10, 2000, 65 FR 42422). Among other things, an action that harasses,

wounds, or kills an individual of an ESA-listed species or harms a species by altering habitat in a way that significantly impairs its essential behavioral patterns is a taking (50 CFR 222.102). Incidental take refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) requires the provision of an incidental take statement specifying the impact of any incidental taking and specifying reasonable and prudent measures (RPMs) to minimize such impacts. Section 7(o)(2) exempts any taking that meets the terms and conditions of a written incidental take statement from the taking prohibition. Take prohibitions of the ESA do not apply to a species until it is listed and, if listed as threatened, protective regulations are in effect.

3.1. Amount or Extent of Take

Individuals of Chinook salmon and steelhead are likely to be present in parts of the action area at times when adverse effects of the proposed actions will occur. The Forney Allotment, Prairie Basin Unit, instream construction actions, and use of the Clear Creek Trailhead ford are reasonably certain to result in incidental take of the listed species because the actions will likely harm, harass, or kill individuals of the ESA-listed species. The other proposed actions are not likely to result in take. The anticipated take would likely not have a significant effect on either species.

Take will likely result from the fish salvage operations associated with the culvert removal at Fourth of July Creek, the culvert removal and ford installation at Woodtick Creek, and the ford installation at the Birch Creek Trailhead. Based on the discussion in Section 2.3.1, each of these three activities will result in the non-lethal take of 10 juvenile salmonids (Chinook salmon or steelhead) and lethal take of one juvenile salmonid (Chinook salmon or steelhead).

Take of spawning fish and their redds is likely to occur in the future from grazing activities on Panther and Moyer creeks on the Forney Allotment and Prairie Basin Unit, and from continued use of the Clear Creek Trailhead ford. These activities are not currently causing take of spawning fish and their active redds, because spawning is not currently occurring in these areas. Any projection of future take is dependent on the successful restoration of fish populations; therefore, the amount of take of spawning fish and their redds cannot be quantified. The extent of take cannot be reasonably projected because spawning is not currently occurring in these areas and patterns of future spawning are unknown. Monitoring is needed to determine when additional actions must be taken to protect spawning areas in upper Panther Creek, Moyer Creek, and the ford on Panther Creek at the Clear Creek Trailhead, and additional interagency discussion is needed to determine what actions may be acceptable. Once spawning fish return to these areas, consultation must be reinitiated.

For other take resulting from habitat alterations related to grazing and portions of the instream construction projects outside the salvage operations, the amount of take cannot be practically obtained because the relationship between habitat conditions and the distribution and abundance of those individuals in the action area is imprecise. In such circumstances, NMFS uses the

causal link established between the activity and a change in habitat conditions affecting the species to describe the extent of take as a level of habitat disturbance. The actions will occur in both riparian and benthic areas within the active stream channel, and will increase turbidity, sediment, and other water pollutants, as well as degrade substrate and bank stability. The consequence of these effects include minor reductions in available space, water quality, safe passage conditions, and food production that will cause most fish to avoid affected portions of the action area during rearing and migration. Some juvenile fish also may be injured or killed by a combination of physical injury and impaired migration.

The extent of non-lethal take resulting from turbidity plumes from the three specified instream construction projects is anticipated to extend from each work area downstream 500 yards and last no more than 8 hours during a single day. No project will last more than 3 days. If this spatial or temporal extent of take is exceeded, work shall cease and consultation must be reinitiated.

Due to the vast action area and the distribution of effects from grazing across this area, the likelihood is very small of discovering take attributable to the grazing allotments. However, because the grazing allotments are ongoing actions, the effects of grazing are reflected in the existing habitat conditions, which are characterized by habitat indicator data collected by the SCNF. Take occurring in these areas should not reach a level that causes a downward trend in the grazing monitoring and habitat indicator data. For the purposes of this consultation, a downward trend for habitat indicators will be identified if water temperature or sediment levels fall within a range of risk and worsen for four consecutive years. If either downward trend is identified within designated critical habitat, consultation must be reinitiated.

3.2. Reasonable and Prudent Measures

The RPMs are non-discretionary measures to avoid or minimize take that must be carried out by cooperators for the exemption in Section 7(o)(2) to apply. The SCNF has the continuing duty to regulate the activities covered in this incidental take statement where discretionary Federal involvement or control over the action has been retained or is authorized by law. The protective coverage of Section 7(o)(2) may lapse if the SCNF fails to exercise its discretion to require adherence to terms and conditions of the incidental take statement, or to exercise that discretion as necessary to retain the oversight to ensure compliance with these terms and conditions. Similarly, if any applicant fails to act in accordance with the terms and conditions of the incidental take statement, protective coverage may lapse.

NMFS believes that full application of conservation measures included as part of the proposed action, together with use of the RPMs and terms and conditions described below, are necessary and appropriate to minimize the likelihood of incidental take of ESA-listed species due to completion of the proposed action.

The SCNF shall:

1. Minimize incidental take by reducing potential impacts from livestock grazing activities in the UPCS along Moyer, Panther, and Fourth of July creeks.

2. Minimize incidental take by reducing potential impacts of elevated sediment levels from the culvert removal at Fourth of July Creek, the culvert removal and ford installation at Woodtick Creek, and the ford installation at the Birch Creek Trailhead.

3. Minimize incidental take by reducing potential impacts of chemical contamination from the culvert removal at Fourth of July Creek, the culvert removal and ford installation at Woodtick Creek, and the ford installation at the Birch Creek Trailhead.

4. Minimize incidental take by ensuring proper fish handling techniques during any salvage operations.

5. Ensure completion of a monitoring and reporting program to confirm this Opinion is meeting its objective of limiting the extent of take and minimizing take from permitted activities.

3.3. Terms and Conditions

To be exempt from the prohibitions of Section 9 of the ESA, the SCNF and its cooperators, including applicants, if any, must fully comply with conservation measures described as part of the proposed action and the following terms and conditions that implement the RPMs described above. Partial compliance with these terms and conditions may invalidate this take exemption, result in more take than anticipated, and lead NMFS to a different conclusion regarding whether the proposed actions will result in jeopardy or the destruction or adverse modification of critical habitats.

1. To implement RPM #1 (reducing grazing impacts), the SCNF shall:

    a. Consistently implement grazing-related standards and guidelines listed in PACFISH (USDA and USDI 1995). This should allow movement toward riparian management objectives for bank stability, water temperature, large woody material, lower bank angle, width/depth ratio and other aquatic habitat elements, which may be affected by livestock grazing.

    b. Ensure cattle are moved from the area immediately when the following applicable indicators of riparian health are reached in areas within designated critical habitat, as outlined in the SCNF adaptive management strategy for grazing within riparian ecosystems (Gamett *et al.* 2005):

(1) stubble height indicators are met

(2) bank alteration exceeds indicators in any stream reach in the unit

(3) shrub browsing - more than light browsing of shrubs occurs in riparian areas

c. If allotment permittees are unsuccessful in moving cattle when triggers are reached or approached, conduct management monitoring (*i.e.,* move trigger) in the subsequent year.

d. Provide the necessary training for all permittees and range riders willing to be involved in monitoring livestock use and pasture move triggers (*i.e.*, stubble height, woody utilization, and bank alteration).

e. Maintain and ensure proper operation of all exclosure structures, such as fences, designed to protect riparian areas.

2. To implement RPM #2 (reducing sediment impacts from instream work), the SCNF shall:

a. Confine construction impacts to the minimum area necessary to complete the project.

b. Restrict use of heavy equipment by selecting equipment that will have the least adverse effects on the environment (*e.g.*, minimally sized, low ground pressure equipment).

c. Before the primary construction activities occur in the project area, place erosion controls to reduce sedimentation, and ensure that these temporary erosion controls are in place and appropriately installed. Effective erosion control measures shall be in place during the proposed activities and will remain and be maintained until permanent erosion control measures are effective. Sediment will be removed from sediment controls once it has reached approximately one-third of the exposed height of the control. If monitoring or inspection shows that the erosion controls are ineffective, mobilize work crews immediately to correct deficiencies.

d. Complete excavation, instream work, and reseeding as quickly as possible.

e. Dispose of channel material and topsoil that cannot be used for restoration efforts in an upland location where it is not likely to enter streams or other waterbodies.

f. Implement a monitoring plan, including site visits, to ensure that replanted riparian areas are stable and project-related erosion is not occurring.

3. To implement RPM #3 (reducing chemical impacts from instream work), the SCNF shall:

a. Require all construction and instream equipment to be clean prior to arrival at the construction site to prevent contamination of the stream by petroleum products.

b. Inspect daily all vehicles and machinery operating within an RHCA for fluid spills. Contain and pick up spills immediately upon detection.

c. Keep an emergency spill prevention and containment plan and kit with machinery at all times.

d. Notify the East Idaho Branch Office of NMFS at (208) 756-5100 in the case of a pollution event or release.

4. To implement RPM #4 (proper fish handling), the SCNF shall:

a. If fish salvage is deemed necessary for juvenile salmonids, contact the East Idaho Branch Office of NMFS at (208) 756-5100 prior to any salvage operations. A representative from NMFS shall be allowed to accompany the capture team during the capture and release activity, and to inspect the team's capture and release records and facilities.

b. Ensure the entire capture and release operation is conducted or supervised by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish.

c. If electrofishing methods are used, adhere to the NMFS guidelines for electrofishing available at http://www.nwr.noaa.gov/ESA-Salmon-Regulations-Permits/4d-Rules/upload/electro2000.pdf.

d. Handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures, to prevent the added stress of out-of-water handling.

e. Transport fish in aerated buckets or tanks, and release fish into a safe release site as quickly as possible, and as near as possible to capture sites.

5. To implement RPM #5 (monitoring), the SCNF shall:

a. Follow these directions: If a sick, injured or dead specimen of a threatened or endangered species is found in the project area, the finder must notify the Boise Field Office of NMFS Law Enforcement at (208)321-2956, and follow any instructions. If the proposed action may worsen the fish's condition before NMFS can be contacted, the finder should attempt to move the fish to a suitable location near the capture site while keeping the fish in the water and reducing its stress as much as possible. Do not disturb the fish after it has been moved. If the fish is dead, or dies while being captured or moved, report the following information: (1) NMFS consultation number; (2) the date, time, and location of discovery; (3) a brief description of circumstances and any information that may show the cause of death; and (4) photographs of the fish and where it was found. NMFS also

suggests that the finder coordinate with local biologists to recover any tags or other relevant research information. If the specimen is not needed by local biologists for tag recovery or by NMFS for analysis, the specimen should be returned to the water in which it was found, or otherwise discarded.

b. Visually monitor to ensure the length of any turbidity plume resulting from instream construction does not exceed 500 yards or last longer than 8 hours.

c. Continue annual habitat monitoring activities for water temperature and sediment levels in Moyer and Upper Panther Creeks, and conform with the SCNF adaptive management strategy for grazing within riparian ecosystems (Gamett *et al.* 2005). This information will be used to ensure that there is not a downward trend in sediment or temperature levels for four consecutive years and to ensure other grazing-related habitat indicators move toward or fall within properly functioning conditions.

d. Monitor the reach of Panther Creek at the Clear Creek Trailhead ford to determine if Chinook salmon spawning activities are occurring. If spawning occurs in this reach, restrict access to the ford and, if necessary, contact the East Idaho Branch Office of NMFS at (208) 756-5100 to reinitiate consultation.

e. Monitor the suitable Chinook salmon spawning reaches of Panther and Moyer Creeks within the Forney Allotment and Prairie Basin Unit to determine if spawning activities are occurring. The IDFG spawning surveys may be used for this monitoring. If spawning occurs in a reach, provide reasonable protection to any active or occupied redds and contact the East Idaho Branch Office of NMFS at (208) 756-5100 to reinitiate consultation.

f. Provide an annual update on the proposed activities in the Panther Creek Watershed, including required monitoring, at a scheduled Salmon-Challis Level 1 meeting after the conclusion of the grazing season and prior to the following season (*i.e.*, late fall or winter).

4. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The consultation requirements of Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions, or proposed actions, that may adversely affect EFH. Adverse effects include the direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside EFH, and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that may be taken by the action agency to conserve EFH.

The Pacific Fishery Management Council designated EFH for Chinook salmon in all parts of the Panther Creek Watershed (PFMC 1999). The proposed actions and action area for this consultation are described in Section 1. The action area includes areas designated as EFH for various life-history stages of Chinook salmon (PFMC 1999). The effects of the proposed actions on EFH are as follows.

1. Removal and stunted growth of riparian vegetation, which may result in increases in water temperature. Measures incorporated into the proposed actions help minimize this effect.

2. Increased turbidity and sedimentation of the substrate in the action area, which may result in displacement of fish using the area for rearing and the loss of pool habitat. Small, localized modifications to substrate will be made at fording sites.

3. Degradation of bank stability, reducing the quality of habitat available for Chinook salmon.

4. Disturbance of feeding habitat for fry and juvenile salmon associated with increases in turbidity interfering with visual predation and siltation decreasing benthic invertebrate production.

4.1. EFH Conservation Recommendations

NMFS believes that the following three conservation measures are necessary to avoid, mitigate, or offset the impact that the proposed actions have on EFH.

1. Implementation of RPM #1 found in the Opinion above.

2. Implementation of RPM #2 found in the Opinion above.

3. Implementation of RPM #3 found in the Opinion above.

4.2. Statutory Response Requirement

Federal agencies are required to provide a detailed written response to NMFS' EFH conservation recommendations within 30 days of receipt of these recommendations (50 CFR 600.920(j)(1)). The response must include a description of measures proposed to avoid, mitigate, or offset the adverse effects that the activity has on EFH. If the response is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the

recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, in your statutory reply to the EFH portion of this consultation, NMFS requests that the number of conservation recommendations accepted be clearly identified.

4.3. Supplemental Consultation

The SCNF must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600.920(k)).

5. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554), known as the Data Quality Act (DQA), specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the document addresses these DQA components, documents compliance with the DQA, and certifies that the Opinion/EFH consultation has undergone pre-dissemination review.

5.1. Utility

The conclusion of this Opinion is that the proposed actions in the Panther Creek Watershed are not likely to jeopardize the continued existence of Snake River spring/summer Chinook salmon and Snake River Basin steelhead. The Opinion also concluded that the proposed actions would not adversely modify or destroy designated critical habitat. Therefore, the SCNF can proceed with implementation of the project. Pursuant to the MSA, NMFS provided conservation recommendations to conserve EFH.

The intended user of this ESA/MSA consultation document is the SCNF. Individual copies of the Opinion/EFH consultation are provided to NMFS, the SCNF, the BLM, the FWS, the IDFG, the Nez Perce Tribe, the Shoshone-Bannock Tribes, and the Idaho Department of Water Resources. The terms and conditions in the Opinion will be used during project implementation. The Opinion will be provided to all interested parties on the NMFS website (http://www.nwr.noaa.gov). The format and naming adheres to conventional standards for style.

5.2. Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, "Security of Automated Information Resources," Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

5.3. Objectivity

The following categories of information describe the objectivity of the consultation:

1. ***Information Product Category:*** Natural Resource Plan.

2. ***Standards:*** This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA Regulations, 50 CFR 402.01 *et seq.*, and the MSA implementing regulations regarding EFH, 50 CFR 600.920(j).

3. ***Best Available Information:*** This consultation and supporting documents use the best available information, as referenced in the Literature Cited section. The analyses in this Opinion/EFH consultation contain more background on information sources and quality.

4. ***Referencing:*** All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

5. ***Review Process:*** This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with Northwest Region ESA quality control and assurance processes.

6. LITERATURE CITED

Barton, D. R., W. D. Taylor, and R. M. Biette. 1985. Dimensions of riparian buffer strips required to maintain trout habitat in southern Ontario streams. North American Journal of Fisheries Management 5:364-378.

Berg, L. and T. G. Northcote. 1985. Changes in territorial, gill-flaring, and feeding behavior in juvenile coho salmon (*Oncorhynchus kisutch*) following short-term pulses of suspended sediment. Canadian Journal of Fisheries and Aquatic Sciences 42:1410-1417.

Bjornn, T. C., and D. W. Reiser. 1991. Habitat requirements of salmonids in streams. Pages 83-138 *in* W. R. Meehan, editor. Influences of forest and rangeland management on salmonid fishes and their habitats. Special Publication 19. American Fisheries Society, Bethesda, Maryland.

Bottom, D. L., P. J. Howell, and J. D. Rodgers. 1985. The effects of stream alterations on salmon and trout habitat in Oregon. Oregon Department of Fish and Wildlife, Portland, Oregon.

BRT (West Coast Salmon Biological Review Team). 2003. Updated status of Federally listed ESUs of West Coast salmon and steelhead. National Marine Fisheries Service, Northwest Fisheries Science Center and Southwest Fisheries Science Center. July. http://santacruz.nmfs.noaa.gov/files/pubs/00687.pdf (viewed 23 November 2005).

Clary, W. P., and B. F. Webster. 1989. Managing grazing of riparian areas in the Intermountain Region. USDA Forest Service, Intermountain Research Station, General Technical Report INT-263, Ogden, Utah. 11 p.

COE (U.S. Army Corps of Engineers). 2005. Natural resource management section: fish counts. Portland District, U.S. Army Engineers. https://www.nwp.usace.army.mil/op/fishdata/ (viewed 5 April 2005).

Denny, L. 2004. Shoshone-Bannock Tribes, Fisheries Biologist. Personal Communication. November.

Denny, L. 2005. Shoshone-Bannock Tribes, Fisheries Biologist. Personal Communication. Email dated March 25, to Dan Blake, NMFS.

Fish Passage Center. 2004. Adult salmon passage at Lower Granite Dam. http://www.fpc.org/adultsalmon/adulthistory/YTD-LGR.html (viewed 27 February 2006).

Forster, K., and E. Rieffenberger. 1993. Panther Creek Sub-basin ongoing and proposed projects: review and cumulative effects analysis. Salmon National Forest.

Gamett, B. L., W. B. Diage, J. B. Purvine, B. Rieffenberger, and G. Seaberg. 2005. A strategy for managing livestock grazing within aquatic and riparian communities on the Salmon-Challis National Forest. May.

Garechana, B. 2005. Salmon-Challis National Forest, Range Management Specialist. Personal Communication with Jim Huinker. January.

ICBTRT (Interior Columbia Basin Technical Recovery Team). 2003. Independent populations of Chinook, steelhead, and sockeye for listed evolutionarily significant units within the Interior Columbia River domain. Working draft of the ICBTRT dated July 2003.

IDEQ (Idaho Department of Environmental Quality). 2001. Middle Salmon River-Panther Creek Subbasin Assessment and TMDL. March.

IDFG (Idaho Department of Fish and Game). 2004a. Aerial Chinook redd count final report. IDFG, Salmon, Idaho. November 22.

IDFG. 2004b. Unpublished survey data from 1985 to 2004. Copy in consultation administrative record.

IDFG. 2005. Aerial Chinook redd counts (draft). IDFG, Salmon, Idaho.

Kutchins, K. 2001. Shoshone-Bannock Tribes internal memorandum to Chad Colter RE: Panther Creek Chinook salmon spawning ground survey. October 29.

Logerwell, E. A., N. Mantua, P. W. Lawson, R. C. Francis, and V. N. Agostini. 2003. Tracking environmental processes in the coastal zone for understanding and predicting Oregon coho (*Oncorhynchus kisutch*) marine survival. Fisheries Oceanography 12:554–568.

Maloney, S. B., A. R. Tiedemann, D. A. Higgins, T. M. Quigley, and D. B. Marx. 1999. Influence of stream characteristics and grazing intensity on stream temperature in eastern Oregon. USDA Forest Service, General Technical Report PNW-GTR-459. 19 p.

Matthews, G. M., and R. S. Waples. 1991. Status review for Snake River spring and summer Chinook salmon. National Marine Fisheries Service, Northwest Fisheries Science Center, NOAA Technical Memorandum NMFS F/NWC-200, Seattle, Washington.

McElhany, P., M. Ruckleshaus, M. J. Ford, T. Wainwright, and E. Bjorkstedt. 2000. Viable salmon populations and the recovery of evolutionarily significant units. National Marine Fisheries Service, Northwest Fisheries Science Center, NOAA Technical Memorandum NMFS-NWFSC-42. 156 p. http://www.nwfsc.noaa.gov/publications/techmemos/tm42/tm42.pdf (viewed 27 February 2006).

Meengs, C. C., and R. T. Lackey. 2005. Estimating the size of historical Oregon salmon runs. Reviews in Fisheries Science 13:51-66.

Murphy, L. 1962. Inventory of Idaho streams containing anadromous fish, including recommendations for improving production of salmon and steelhead, Part 1: Snake, Salmon, Weiser, Payette and Boise river drainages. Idaho Department of Fish and Game. June 30.

Neff, J. M. 1985. Polycyclic aromatic hydrocarbons. Pages 416-454 *in* G. M. Rand and S. R. Petrocelli, editors. Fundamentals of aquatic toxicology: methods and applications. Hemisphere Publishing Corp. (McGraw-Hill International Book Co.), Washington, D.C.

NMFS (National Marine Fisheries Service). 1996. Making Endangered Species Act determinations of effect for individual or grouped actions at the watershed scale. Environmental and Technical Services Division, Habitat Conservation Branch. August.

NMFS. 1999. The habitat approach: implementation of Section 7 of the Endangered Species Act for actions affecting the habitat of Pacific anadromous salmonids. Northwest Region, Habitat Conservation and Protected Resources Divisions, Portland, Oregon. August 26.

NMFS. 2002. Interim abundance and productivity targets for Pacific salmon and steelhead listed under the Endangered Species Act in the Interior Columbia Basin. http://www.nwcouncil.org/library/2002/NMFSTargets2002_0404.htm (viewed 19 October 2005).

NMFS. 2005. Appendix I: CHART assessment for the Snake River Basin steelhead. August. http://www.nwr.noaa.gov/Salmon-Habitat/Critical-Habitat/2005-Biological-Teams-Report.cfm (viewed 23 November 2005).

NPCC (Northwest Power and Conservation Council). 2004. Salmon Subbasin Plan: Salmon Subbasin Assessment. June. http://www.nwcouncil.org/fw/subbasinplanning/salmon/plan/ (viewed 27 February 2006).

NPPC (Northwest Power Planning Council). 1995. Smolt Density Model Data. Available at http://www.streamnet.org/subbasin/2001-subbasin-data.html (viewed 27 June 2005).

NRC (National Research Council). 1996. Upstream: salmon and society in the Pacific Northwest. National Academy Press, Washington, D.C. 452 p.

Overton, C. K., J. D. McIntyre, R. Armstrong, S. L. Whitwell, and K. A. Duncan. 1995. User's guide to fish habitat: descriptions that represent natural conditions in the Salmon River Basin, Idaho. USDA Forest Service, Intermountain Research Station, General Technical Report INT-GTR-322. August.

PFMC (Pacific Fishery Management Council). 1999. Amendment 14 to the Pacific Coast Salmon Plan. Appendix A: description and identification of essential fish habitat, adverse impacts and recommended conservation measures for salmon. Pacific Fishery Management Council, Portland, Oregon. March. http://www.pcouncil.org/salmon/salfmp/a14.html (viewed 20 June 2005).

Platts, W. S. 1991. Livestock grazing. Pages 389-424 *in* W. R. Meehan, editor. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society, Bethesda, Maryland. 751 p.

Resseguie, T. 2004. Lemhi River Monitoring Plan: 2003 Annual Progress Report. Idaho Department of Fish and Game, Salmon, Idaho. February.

Roberts, B. C., and R. G. White. 1992. Effects of angler wading on survival of trout eggs and pre-emergent fry. North American Journal of Fisheries Management 12:450-459.

Rose, R. 2005. Biological assessment for proposed and ongoing activities within the Panther Creek drainage on Snake River spring/summer Chinook salmon, Snake River Basin steelhead trout, Columbia River bull trout, and Snake River sockeye salmon. Salmon-Challis National Forest, Salmon-Cobalt Ranger District, Salmon, Idaho. March 15 (amended February 15, 2006).

SBT (Shoshone-Bannock Tribes). 2004. Unpublished survey data from 2002 and 2003. Copy in consultation administrative record.

Scrimgeour, G. J., and S. Kendall. 2003. Effects of livestock grazing on benthic invertebrates from a native grassland ecosystem. Freshwater Biology 48:347–362.

Sigler , J. W., T. C. Bjorn, and F. H. Everest. 1984. Effects of chronic turbidity on density and growth of steelheads and coho salmon. Transactions of the American Fisheries Society 113:142-150.

SNF (Salmon National Forest). 1988. Land and Resource Management Plan for the Salmon National Forest.

Spence, B. C, G. A. Lomnicky, R. M. Hughes, and R. P. Novitzki. 1996. An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, Oregon. December.

Stelle, W., Jr. 1995. NMFS Letter to Dale N. Bosworth, Regional Forester, U.S. Forest Service, Region 4, RE: Consultation on Salmon and Challis National Forests ongoing and proposed actions in the Panther Creek, North Fork Salmon River, Lemhi River, East Fork Salmon River, Morgan Creek, Valley Creek, and Lower Salmon River section 7 watersheds. July 31.

USBWP (Upper Salmon Basin Watershed Project) Technical Team. 2005. Upper Salmon River recommended instream work windows and fish periodicity for river reaches and tributaries above the Middle Fork Salmon River including the Middle Fork Salmon River drainage. June 2004, revised November 2005.

U.S. Census Bureau. 2005. State & County QuickFacts. Idaho QuickFacts: Lemhi County, Idaho. http://quickfacts.census.gov/qfd/states/16/16059.html (viewed 18 October 2005).

USDA (U.S. Department of Agriculture) and USDI (U.S. Department of Interior). 1995. Environmental Assessment for the Implementation of Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH). March.